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THE AUTOMOBILE

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FIFTH ANNUAL SHOW IN NEW YORK.

Most Complete and Best Attended Exhibition Ever Held in America Opens its Doors to the Public Saturday, January 14.—Marked Improvements in Construction.

AGAIN for the fifth time the annual New York show of automobiles is on at the Madison Square Garden, bringing from a still wider radius and in greater numbers representatives of all ranks of motordom. Other shows, some of them of more than local importance, will be held in the course of the next month or two, but the New York Show still is and is likely to remain, the greatest of all and the most thoroughly national and international.

A single round of the main floor brings home to the visitor two prominent points of the Show; the high character of the exhibits and the inadequacy of the Garden,

BIRD'S EYE VIEW OF THE FIFTH ANNUAL AUTOMOBILE SHOW IN MADISON SQUARE GARDEN, NEW YORK.
Photographed for The Automobile by Levick.

the largest building in New York, to accommodate anything like a complete representation of the American automobile industry.

Of the cars, it may be said that they disclose substantial improvement along safe, conventional lines; there is a notable absence of freaks, and the marked improvements told later in detail are obviously the result of careful study on the part of the makers to meet the reasonable and practical demands of users. Speed is far less in evidence than comfortable seating and easy riding; these being the main ends now sought by the majority of motorists.

The narrow limits of space are doubly unfortunate in that the exhibit as it stands cannot be viewed to advantage, and it falls short of that international character which is in every way desirable. The necessity for holding an entirely separate exhibit of foreign cars narrows the scope of the Garden Show. Even at the present time, American makers could ask nothing better than to have their work shown, year by year, beside the finest products of the European shops. The wonderful progress of the past five years, more than ever emphasized at this Show, gives convincing proof of the final result of such successive comparisons, in which the American builder has the immense advantage of a thorough knowledge of American conditions of travel and operation.

The opening of the Show on Saturday evening, January 14, was of the usual informal nature, quite in keeping with the commonplace surroundings. In point of mechanical perfection, of popular interest, and of money value, the exhibit of 1905 far surpasses all previous years, and yet the settings for this magnificent display are, if anything, poorer than ever.

Beyond the hanging of some bunting from the upper galleries no attempt was made at decoration; and apparently neither the Garden management, the Automobile Club nor the Manufacturers' Association concerns itself with the matter of uniform and artistic decoration of stands; consequently such good work as is attempted by individual exhibitors fails of effect. The discordant efforts of a poor orchestra add harmony only to the extent that they are in keeping with the *ensemble*.

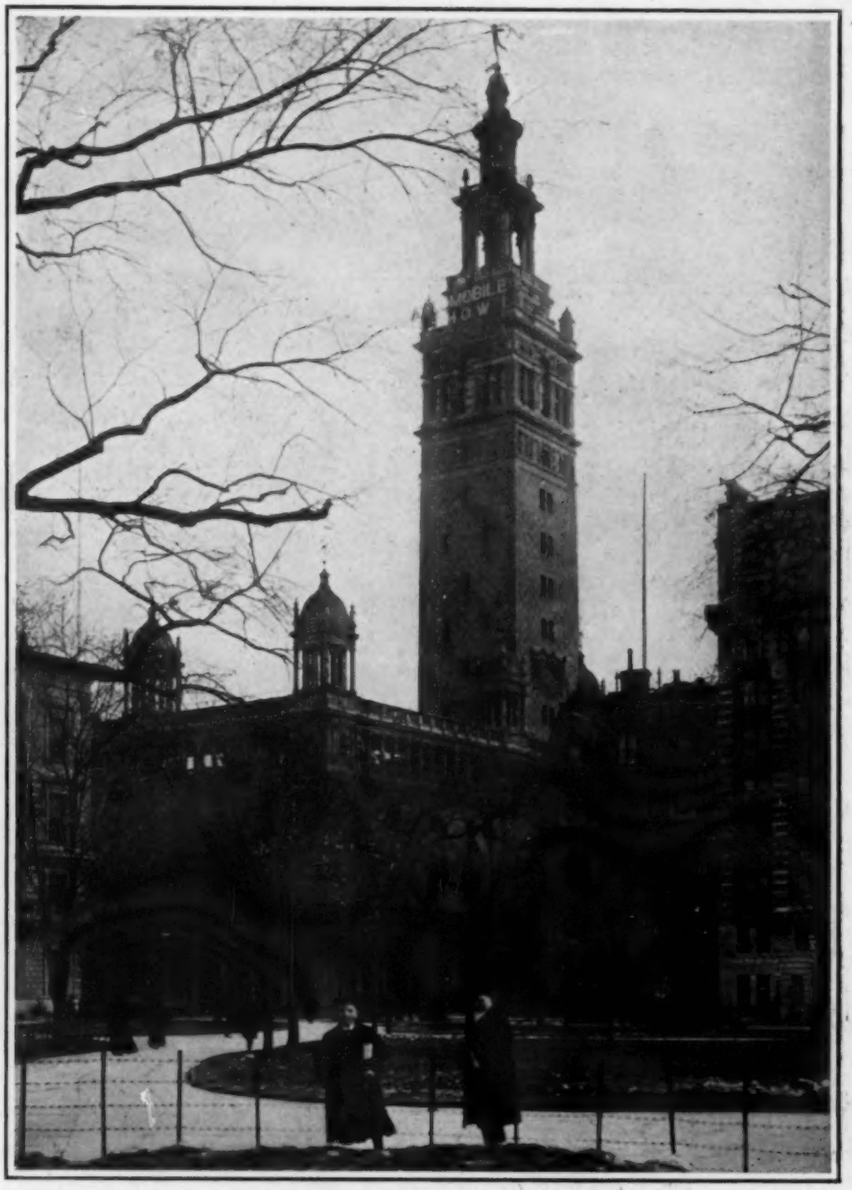
The Show has thus far been fortunate in the important matter of weather. Last year New York was deep in snow and slush for a part of the week, while many exhibits were delayed in transit by snow storms in the West. This year the keen edge of a cold wave cleared the skies and sent the thermometer down into the 'teens on Saturday and Sunday, the streets were dry and clean—for New York—and the conditions continued to the time of writing, the temperature rising on Monday and Tuesday, but with a continued promise of good weather. Similar conditions throughout the country facilitated the arrival of exhibits, and by 8 o'clock on Saturday night the Show was quite as well advanced as it ever is at that hour.

The attendance from the opening has been very large, far too large for comfort, and, perhaps, for the best interests of business. The aisles are constantly jammed from noon onward, the stands are crowded, and progress is proportionately slow, while anything like a careful and deliberate examination of a machine is a matter of difficulty, as, even when it is reached, one is elbowed and crowded and unable to move freely. The exact nature of this crowd is as yet a question; among it are many dealers from the country at large, and many who are or would be automobilists, and who are deeply interested in all the machines of one class, or perhaps several classes.

There is so much to see that, on the opening days, sales to individual buyers were not so large as many had supposed. Toward the end of the week, however, the buying public will have made up its mind, and judging from the close interest shown in the exhibits of complete cars, the sales will be record-breakers.

Apart from the crowd, the facilities for study and comparison are all that could be desired. It is probable that the American type of opposed and single-cylinder horizontal motor within the body is now at its highest development in point of numbers and of perfection of individual machines. It is shown in a very large variety of makes, positions, disposition of parts and appurtenances. Beside it on every hand are the vertical motors of the French type, with all forms of cylinder, and in numbers from one to six. Many chassis are shown, mounted on blocks over mirrors, with handhole plates and covers removed, and driven by electric motors.

As long ago as the days of the first



EXTERIOR VIEW OF THE "GARDEN" LOOKING NORTHEAST ACROSS MADISON SQUARE.

LOOKING SOUTHEAST ACROSS MADISON SQUARE, FLATIRON BUILDING IN BACKGROUND.
Publication Offices of The Automobile are in this Building.

shows, when the few twelve-horse Panhards were looked upon as useless monsters, and the little de Dion motorettes as toys, when the American shaftless carriages were almost uniformly oblong black boxes on wheels, with single-cylinder horizontal motors, in the most inaccessible position that could be found under the seats, THE AUTOMOBILE predicted the ultimate selection of the French road locomotive with vertical motor beneath the front hood. How true this prediction was is seen to-day, when almost every car, including the steamers, and even some electrics, shows the French hood, front seats, wheel-steer and tonneau body. It is true that some of these hoods merely conceal a gasoline tank and battery box, or serve to carry luggage, the cars being driven by very good horizontal motors; but this does not affect the general proposition that the perfect automobile is no mere horseless or shaftless carriage, but a radically new type of vehicle, whose possibilities are even yet unfathomed.

The trend of the times seems clearly indicated by the present extensive exhibit; in the first place, the popular demand, as shown by the efforts of the makers, is for every class and price of vehicle, from the cheapest possible runabout up to the most costly and elegant type of touring car and city carriage. While some firms strive to meet the wants of several classes of users, others confine themselves to some one particular class, possibly the $700 runabout, or the $5,000 touring car, of which they make a specialty.

In the specific form of vehicle, the French type, as already noticed, is strongly predominant, and the majority of this type in external appearance possess the essentials as well in a vertical motor forward, with wheel-steer and kindred details. One great change is noticeable in almost every grade of car; the so-called "tonneau," or square box body with rear door, has disappeared, giving place to a longer body, with side doors, one wide, deep rear seat, and greatly increased footroom. Though the name "tonneau" is still generally retained, these very different cars are more properly phaetons, or, by American usage, surreys. With this form of body there goes, as a matter of course, an increased wheel-base. Fashion dictates two individual seats in front, and the entrance to both front and rear seats is greatly facilitated by the expansion of the ordinary individual steps into a long, broad step, known, from railroad parlance, as a "running-board." Where the side chains are used, a second short step over the sprocket wheel, taking its name from the latter, becomes necessary; and a similar step is employed in some cases where the drive is by central shaft, for more convenient access to a high body. From a mechanical point of view, the governing motive of car design throughout the entire exhibit is the side-entrance body.

The jostling, pushing, good-natured crowd, including all classes from club members and ladies in elaborate costumes to skin-clad chauffeurs, changes its relative proportions from hour to hour through the day and evening, making the task of analysis a difficult one. It is safe to say that during the seven days and nights nearly everyone interested in motoring, either directly as owner and driver, or merely as an occasional passenger, with every class of the trade, within the limits of New York and its suburbs, will see the Show at least once, if not several times, while the outside attendance from distant cities will be even greater than usual.

Technical Tendencies Observed at the Garden.

IT might be said with respect to the exhibits at the Importers' Salon that the French and German automobile has been developed to a point where there ceases to be substantial unanimity regarding the next improvements to be made in the mechanical detail, so that in clutch design, brake design, ignition and the like each manufacturer seems to be experimenting between two or more possible lines of change of almost equal merit. On the other hand a survey of the new American models for the opening year indicates that, with all but the most completely Europeanized builders, the trend of progress is still along definite lines easily described, and in many cases pointing to an outcome predicted with almost equal ease.

Runabouts Are Scarce.

In this sense it is evident that the automobilist, like any one else, enjoys his sport best when he can share it with his friends. A few years ago the two-passenger car was almost the one thing thought of. Today the light two-passenger runabout is conspicuously the exception, if one compares the number of such models with the number of four or five-passenger models exhibited at the show. Certain large manufacturers—our old familiar friends—still show their two-passenger models, but almost without exception these have sufficient power to permit the addition of a tonneau or surrey rear seat. In some cases the transformation from the runabout to the light four-passenger car has been made without increase in motor dimensions, simply by refining the design of the motor, by cutting down weight throughout the car, while preserving strength; and by improving the efficiency of the transmission. In other cases the motor has been increased in power often without increasing the total weight of the car.

It is significant that nearly every runabout builder has increased by one or the other of these means the carrying capacity of his vehicle from two to four passengers. That certain former builders of runabouts have so far increased the size and power of their machines without changing the general type that they now can be classed as touring cars, and that certain other runabout builders have gone a step farther, either with or without the retention of their light models, by building motor in front touring cars usually with four cylinders arranged fore and aft, sliding gear transmission and propeller shaft drive.

Air-Cooled Motors Numerous.

Hardly less important a feature of the show in the direction of structural tendencies is the noticeably more widespread adoption of the air-cooled principle. There are a dozen exhibitors of cars in which air-cooled motors are employed. It is difficult to decide to just what extent this increase represents solid achievement on the part of these recent makers.

It is a sure indication, however, that the air-cooled motor has caught on tremendously. It is really along this line of investigation, more than along any other, that a true American type of car can be developed. With the increase in the number of exhibitors there is a notable increase in the size of the air-cooled installations. Several cars of the touring type proper are shown equipped with air-cooled engines.

It may be supposed that many of the makers of new forms of air-cooled motors have been experimenting with them for some time past, but have deferred their public announcement until satisfied that the air-cooled motor would be not only mechanically but commercially a successful proposition. Certainly the work on some of these exhibits is of high merit.

Side Entrance Holds Sway.

The universal sway of the side-entrance machine abroad has had its natural effect in this country, and this year probably three-fourths of the touring cars are thus equipped. In many cases this change of body has been made without what would abroad be considered adequate lengthening of the wheelbase for the side entrance doors are apt to be rather contracted. On the other hand there is no question that the wheelbase can be improved all along, and anything over 100 inches between the axles must give a good explanation of itself to be acceptable. The long wheelbase car rides easily and is not racked on a rough road like the short wheelbase car. On the other hand, it is more liable to skid and the percentage of weight on the rear axle with a front motor is apt to be insufficient. Moreover, it becomes something of a problem to obtain the necessary stiffness in the frame when the supports are so far apart.

In line with the transitional phenomena noted may be mentioned the rather considerable number of makers who lately used the horizontal motor under the body, and now have substituted a double opposed motor lying transversely under a front bonnet and driving through either planetary or sliding gear transmission.

Planetary Gear Systems Improved.

In spite of the rather questionable repute of the planetary transmission two or three years ago, it seems fairly to have held its own, and is now in use in a number of the least expensive touring cars of 15 to 20 horsepower. While the majority favors the sliding gear for cars of such size, examination shows that the planetary gears this year are well constructed, and of liberal dimensions, so that they should not give trouble by wearing out or failing to lubricate properly.

[LOOKING NORTH ON MADISON AVE. AT THE REAR OF THE GARDEN—DEMONSTRATION CARS LINED UP AND UNDER WAY.]

Fire Protectors Are Numerous.

Users interested in minimizing the largest item of a car's up-keep will notice with interest the increasing vogue of certain tire protectors, notably the familiar "Samson" protector, a leather shoe studded with large headed rivets and strapped or otherwise secured over the tire. This device, although designed primarily as a protection against skidding, and doubtless much more needed for that purpose with the very long wheelbases now commoner than it was a couple of years ago, is also more or less of a safeguard against puncture. The development of this idea has already engaged the attention of the trade abroad, and from appearances at the Garden show is rapidly attracting attention here.

Coming again to bodies, it is not strange to note that the various enclosed types of body, notably, of course, the limousine, are enjoying their highest popularity thus far. Nearly all the vehicles thus designed appear to be intended chiefly for town use, and this seems wholly reasonable, as bodies of this sort would be subjected to very severe stresses in touring over give-and-take roads.

Metal to Metal Brakes.

Among details there is an almost universal acceptance of the internal expanding brake, with metal to metal surfaces. In a few cars this brake is supported or stayed so that it imposes no twisting stresses on the axle and springs when applied. In a majority of cases, however, this is not the case, the axle itself forming the brake support, and the rear springs being required to stand the entire strain.

All metal clutches are also increasingly used, judging from their adoption in many of the show cars.

Ball and Roller Bearings.

Ball and roller bearings are more in evidence than before. Several makers have adopted adjustable ball bearings in the gear box and rear axle, and at least one builder who exhibits a beautifully finished chassis uses roller bearings throughout the transmission system. In other cars the use of imported ball bearings was noted.

Summary of Tendencies.

In a word, one may summarize the show tendencies of 1905 about as follows: Fewer runabouts and more four-passenger cars; a great increase in the number of air-cooled motors; four-cylinder motors and sliding gears for touring cars; horizontal single-cylinder and double opposed motors and planetary gears for runabouts, with an intermediate class of low-priced touring cars with magnified runabout engines and transmission; a revival of the all-metal clutch in various forms; persistent efforts to find satisfactory ball bearings, with success apparently not far distant; side entrance bodies, closed bodies and greater comfort generally; and, of course, in large and small details, mechanical improvements, better materials and workmanship, and better value for the price charged.

Cars Exhibited on the Main Floor.

THE visitor to the New York Automobile Show, passing through the portals of Madison Square Garden, finds himself on the main floor, which is occupied entirely by complete cars, almost all of which are the product of the larger manufacturers. Gasoline cars predominate very largely. Yet steam has not by any means disappeared, as is shown by the exhibits of four makers of steam vehicles exclusively; while electricity as a motive power is strongly, though not largely, represented. Quite a number of exhibitors show chassis, some handsomely finished and having sections of cylinders and valve chambers cut away to show the operation of the working parts, and kept in motion by electric motors. The number of features of interest cannot be judged by the mere number of exhibitors; for many manufacturers who exhibited only one or two models at previous shows, have now complete lines. In the working out of the new models the requirements of the different sizes have been studied and many changes made in the mechanisms, instead of merely building enlarged or reduced facsimiles of the same machine. In many stands separate parts are shown.

By reading the descriptions of exhibits in the present issue of The Automobile, in connection with the diagrams of the spaces, published in last week's issue, the reader who has visited the show, will probably find that he can identify exhibits that attracted his attention, but could not be identified apart from their surroundings. Following are descriptions of the main floor exhibits:

American Motor Company.—This company making the Marsh motor-cycle, exhibits its first automobile; a two-cylinder, vertical, 10-horsepower, air-cooled, runabout, with wood frame and wheels. The wheel-base is 80 inches, with a gauge of 54 inches, there are two individual seats with platform for luggage in the rear; the motor being under a hood in front. The planetary transmission gives two forward speeds and reverse. The Marsh motor-cycle is unchanged from last year, except for the use of a wider belt, 1¾ inches, with G & J tires, and the placing of the battery box under the saddle.

Apperson Brothers Automobile Company.—The new 40-horsepower 1905 cars are an enlargement of last year's 24-horsepower, showing a lengthened wheelbase and side-entrance bodies. The arrangement is the same as last year—four vertical cylinders in front, sliding-gear transmission in one case with differential, and side chains. A polished chassis of the 40-horsepower car with crankcase and gearcase open shows the whole construction very thoroughly. After experiments with the ordinary types of cone clutches, they have been abandoned for an external band clutch, which has proved perfectly satisfactory. A new automatic carbureter is fitted this year, controlled by foot throttle and requiring no adjustment, whatever the season or the atmospheric conditions. The jump spark and battery ignition are retained, with spark control on wheel. In the longer cars the steel frame is specially strengthened by a truss.

One finished car is shown, the 40-horsepower phaeton, with side door, fitted with long cape top. The car is very handsomely finished in cadet gray paneled in light green with gold stripes, the chassis and wheels being of the same color; the interior is upholstered in grass-green leather. The car is entered from a running-board and sprocket step, and extra seats may be fitted to accommodate five in all in the tonneau.

Baker Motor Vehicle Company.—These well-known electric cars show no material change from last year, the standard of quality in mechanical and electrical detail, as well as in style and finish, being fully maintained. The Baker imperial runabout and the stanhope are known to everyone; and the surrey, though a newer type, has already been seen at the Garden. The one novelty is a handsome depot carriage, with motor in front under a small bonnet, central shaft drive with bevel gear, running-board between fenders, and closed body with full side doors, and large plate glass windows in front, sides and back. It is finished in Brewster green and black, with red stripes on gear and wheels. The interior is handsomely upholstered, with electric light, pockets and similar furnishings. The normal speed is 12 miles, the maximum 14 miles, and the mileage capacity is forty miles.

Corbin Motor Vehicle Corporation.—Two side-entrance tonneau touring cars, with four-cylinder air-cooled motors, were exhibited by this firm and marked the entry into the automobile manufacturing industry of the American Hardware Corporation. This corporation includes the Russell & Erwin Mfg. Co., P. & F. Corbin, and the Corbin Screw Corporation, in addition to the Corbin Motor Vehicle Corporation. Although the Corbin car is exhibited for the first time, it is actually two years old, that time having been employed in this development. The car was shown in two models, one of 24-30 horsepower, and the other of 16-20 horsepower, the latter, however, not possessing the twin cooling fans and differing in many other minor respects from the higher powered vehicle.

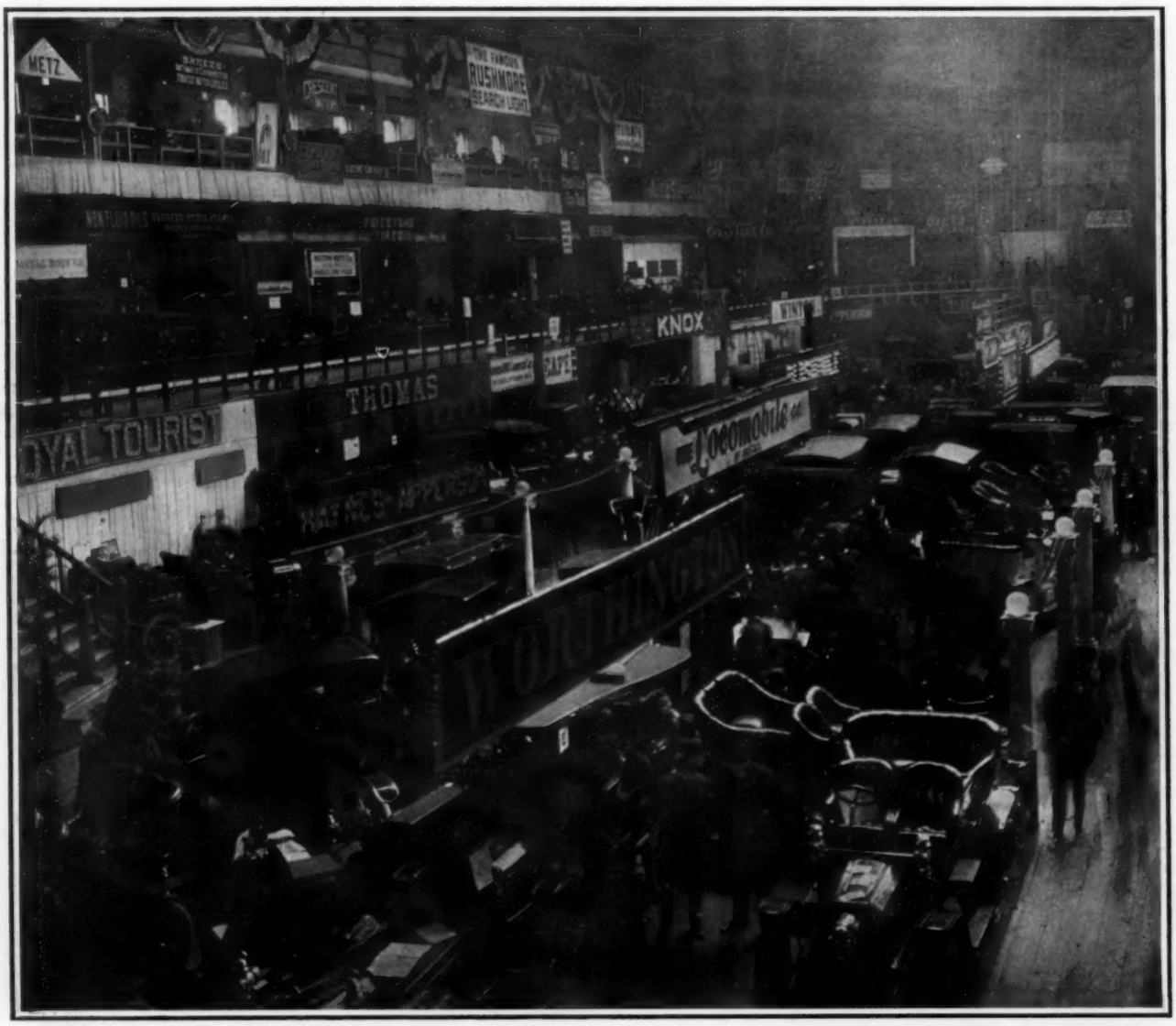
The cooling of the Corbin cylinders is effected by the use of a series of cone-shaped blades punched from soft wrought steel in such a manner as to leave the edges irregular. The surface of the blades is then treated by a process which augments the radiating qualities of the metal and the

blades are then inserted in the grooves cut in the outer cylinder walls and the cylinder metal is peined into recesses in the base of the blades, making them practically integral. A free and constant circulation of air coming in contact with the heated flanges is accomplished by centrifugal fans positively driven from the engine shafts. This system is applied to all Corbin motors, the only variation being that in the large touring car the radiating blades are placed parallel with each cylinder and are cooled by two fans located over the cylinder heads, while in the smaller car the blades encircle the cylinder and one fan located in front of the motor is used.

The crank has five main bearings and four throws, equally balanced. The crank case is split on the center line of the crank. In the higher powered motor the case is supported on an angle steel sub-frame, while in the lower power vehicle no sub-frame is used, the crank case having cast steel supports bolting directly to the main side frame. In both models the space between the crank case and the main frame is closed in with sheet steel, producing a pan construction, which protects the motor from dust and dirt. The cylinders are cast separate with valves assembled in cages in the cylinder heads. On the larger engine all valves are mechanically operated, but the inlet valves of the smaller model are automatic.

The clutches of the internal conical metal type are leather faced. Six spring shoes are provided in the male member, the friction of which serves to gradually pick up the load. The transmission is of the sliding gear type, three speeds forward and reverse, with direct drive on the third speed. The change gear mechanism is operated by one hand lever and is identical in both models. The larger model having a double chain drive, the differential gear and counter shaft are in a case integral with the transmission case. The drive to the counter shaft is transmitted by a set of steel bevel gears, the resultant strain being carried by extra large roller bearings with ball bearings to receive the end thrust. The smaller model, which is shaft-driven, is connected through a universal propeller shaft to the bevel gear driven rear axle.

There are two distinct braking systems. The service brake is operated by a right foot pedal, acting on a drum on the transmission and for all ordinary purposes is the only brake required. The emergency brake, which is operated by a hand lever,



GENERAL VIEW OF THE INTERIOR OF THE MADISON SQUARE GARDEN SHOWING EXHIBITS

is most powerful, and acts direct on the rear wheel hubs. The car is guided by a 15-inch wheel, operating on an irreversible steering mechanism. The levers for controlling the spark and throttle are located upon the steering wheel; the normal running speed of the larger motor is maintained by a centrifugal governor, located on the half-speed shaft. This may be thrown out of action and the maximum speed of the motor attained by pressing the accelerator foot pedal. The smaller model is

controlled entirely by hand and foot levers. The carbureter is of the constant level spraying type, with a compensating air inlet. The ignition is by a quadruple vibrator coil, the current being supplied by a six-volt storage battery on the larger car and a double set of dry cells on the smaller. A force feed lubricator is used, which forces oil at regular intervals and in uniform quantities to the cylinders. The main crank bearings and crank pin bearings are lubricated by a splash system from oil carried in the closed crank case. The bearings of the transmission are all lubricated by a compression grease cup attached to the dashboard, which forces grease through a pipe direct to the bearings. The change-speed gears are lubricated by heavy oil in the lower half of the gear case.

The wheel base of the larger car is 106 inches, the track 56 inches, the speed 37 miles an hour, the capacity five passengers, and the weight 2,400 pounds. The wheel base of the smaller model is 94 inches, the track 56 inches, the weight 1,750 pounds, the capacity four passengers and the speed 26 miles an hour.

Covert Motor Vehicle Company.—Two cars comprise the exhibit of this company, one being a four-cylinder side entrance touring car with a seating capacity of five passengers, which was shown for the first time, and the other being the single cylinder runabout, which was exhibited last year. Both are of the Covert chainless type. The motor of the larger car comprises four cylinders, vertical and water cooled, located under a bonnet of conventional form. The cylinders are cast separately, with heads, water jackets exhaust and inlet chambers integral. All working parts of the motor can be readily inspected by removing the covers at the sides of the motor case and, if necessary, the whole lower case can be removed without disturbing any of the bearing adjustments. All cam shaft gears and cams are enclosed within the motor case. The fly-wheel and clutch are enclosed in an aluminum case, which protects the entire motor and its mechanism from dust.

The carbureter is of the single automatic type, placed close to the motor and so arranged that the mixture travels the same distance to each cylinder. A combination timer and distributer is used, thus requiring the use of but a single coil. The timer is placed in an upright position above the center of the motor and is driven by mitered gears from the cam shaft. The current is furnished by two sets of batteries. The transmission is a sliding gear with three forward speeds and reverse and is ball bearing throughout. Gears and bearings of the transmission are lubricated by splash and from an auxiliary oiler in the front of the car. The control is by spark and throttle levers situated above the steering wheel. There are two pedals, one controlling the combined clutch and brake and the other equipped with a locking device controlling the hub brakes.

ON THE MAIN FLOOR AND THE LOCATION OF STANDS IN THE GALLERIES—LOOKING EAST.

A double locking system makes the accidental shifting of gears impossible. The steering is by an irreversible worm gear with a mahogany hand wheel. There are band brakes on each wheel with an equalizing adjustment which assures equal pressure on each brake drum when the brakes are applied; also a brake on the reverse side of the clutch, which works through the propellor shaft. Cooling is effected by means of a radiator with flat tubes and square fins and a fan placed behind the radiator and driven by a belt from the motor shaft. The circulation is effected by a positive chain-driven pump. The gasoline tank has a capacity of twelve gallons. The wheel base is 94 inches, the track is of standard width, the horsepower 20-24, the weight 1,750 pounds.

The Covert chainless runabout has a single vertical motor with air-cooled cylinder of 4-inch bore by 4 1-4 inch stroke and a water-cooled head, developing 6 1-2 horsepower. It is substantially the same car as was shown last year, except that a number of minor improvements have been added to bring it up to date.

Duryea Power Company.—The folding rear-seat phaeton with extra folding front seat is shown, described very fully in THE AUTOMOBILE, on the occasion of the last Show; no changes have since been made except the use of a Remy alternating magneto, gear-driven. Certainly his worst enemy, if one could conceive of Mr. C. E. Duryea having an enemy of any kind whatever, would never suspect him of producing or even tolerating, a vehicle with a motor in front; but he has a model of one now on exhibition. True, it is a balloon, the Duryea Company now building special light motors for airships; but it certainly is intended for a motor in front instead of under the rear seat; whether it will have three or four wheels, and just how it will steer, cannot be ascertained from the model.

Elmore Manufacturing Company.—The only two-cycle car was rather inadequately represented last year; but in the interim it has been materially improved and has made a new record through the touring exploits of the little *Pathfinder* between New York and St. Louis. What the car has actually done, needs no further mention at this time; in its new form it is a small and compact but very comfortable four-passenger car, with a body of the latest type, wide rear seat, door and running-board on each side, a smart bonnet in front with vertical dash, and all the style of the ordinary small motor-front touring car. The two cylinders, each 4½ by 4, two-cycle, lie horizontally side by side, the pistons working fore-and-aft, with planetary gearing and central chain drive to rear axle. Aside from the two-cycle operation, the general arrangement of the mechanism is one that has been proved to be thoroughly practical in small cars of moderate cost, so that experimental constructions are eliminated. The wheel-base is 83 inches, with 56 inches gauge; the motor is rated at 16 horsepower, the suspension is such as to give easy riding, and the body will accommodate four comfortably, or even a fifth person if necessary. The car shown is neatly finished in dark blue, relieved by a broad band of a lighter blue around the tops of the seats; the chassis being in yellow. The smaller car, a rear-door tonneau with single cylinder, is also shown, finished in deep red.

Grout Bros.—These makers, who continue firm in their advocacy of steam as a motive power, show a new touring car with a side-entrance body accommodating five passengers, the result of 2 1-2 years experimenting. A prototype of this model was shown two years ago and attracted great public attention on acount of the brass guards placed in front of the condensing coils, which gave it a strong resemblance to a locomotive.

The new car follows the accepted Grout construction in general, some of the special features being an 18-inch fire tube copper boiler, wire wound, and with a safety plug attachment, which eliminates all danger of burning out. The 12-horsepower engine is completely encased and is absolutely dust proof. Every working part is automatically oiled.

The burner is of cast iron, slotted in one piece, with a new air mixing adjustment. There is an anti-freezing device, which the exhibitors say makes it impossible for the car to freeze up in any kind of weather. The boiler is enclosed in a barrel-shaped hood in front, and the water tank is under the floor of the body.

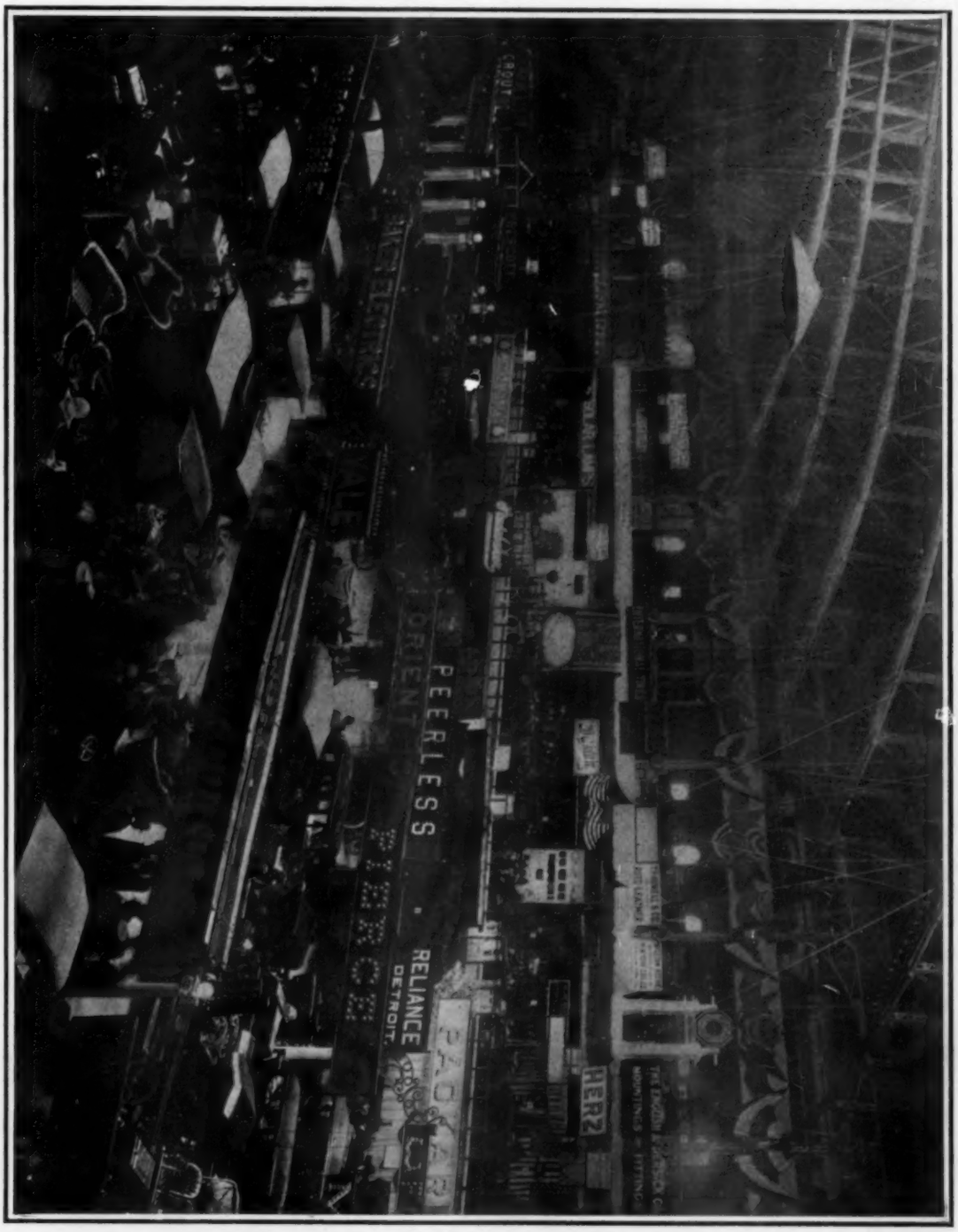
Haynes-Apperson Company.—Last year this company exhibited cars of the French type in general appearance, but with the regular horizontal motor in body; this year it shows an entirely new design, with four-cylinder motor under hood in front. It is needless to say that the design follows the systematic and mechanical methods which have made the cars so popular in the older patterns of motor and body; the motor is designed with specially long and large bearings, the exterior is finished in oxidized copper, preventing rust. Two features call for special comment; the motor is hung from the pressed steel frame by four arms of the usual form, but two braces are added at each end, from the frame to the head of motor, each pair of arms below and braces above, making a diamond frame truss which braces the motor and counteracts all turning tendency. The transmission is by central shaft, but in place of the usual bevel gears, the driving pinion is fitted with hardened steel rollers, while the gear on the axle is a side sprocket engaging the rollers; the teeth of the sprocket are much larger than would be possible in a bevel gear, and the friction is reduced. The Haynes individual clutches are still used, giving three speeds and reverse, with a special form of slip-joint in which four prongs grasp lightly the body of the universal joint, all working in grease. A special form of stay-bar is used, extending upward from the differential case and held at the top by a guide rod, attached to the rear of the chassis, within which it slides freely to admit of a vertical motion of the body. A wheel-base of 108 inches, gives length for a wide side door, with long running-board. The body is of the *Roi des Belges type*, with swelled individual front seats; the rear seat being built of aluminum and the front seats of wood staved up and screwed. The regular green-black and gold with the Haynes medallion showed the relationship to the older cars.

The two-passenger convertible car, with the old style of motor, is now built with a wheel-base of 81 inches, an increase of 5 inches from last year; a special feature is the addition of adjustable roller bearings on the main shaft. The entrance is from the side, as in former years. The body is finished in light green with black chassis and gold trim; another car is of the same pattern shown in maroon.

Kirk Manufacturing Company.—The Yale car made by this company, was shown last year in the 14-16 horsepower, with two opposed cylinders under the body of the car, with rear-door tonneau; this year the same car is shown with side-entrance, and an entirely new car is added. This is 24-28-horsepower, with four-cylinder, vertical motor, cylinder cast separate, under the hood, and central shaft, bevel-gear drive, with cone clutch and sliding gears, three forward speeds and reverse. The frame is still of special angle steel, but the general construction has been greatly improved. The body, chassis and wheels are finished in blue, with black moldings and yellow stripe; the smaller car being in the same colors. The large car has a victoria top.

Worthington Automobile Company.—The Berg cars shown by this company, include four of the 24-horsepower, two with rear and two with side-entrance. Three are finished in dark blue, and one in maroon, with leather to match bodies. A Meteor car of 18-horsepower, with rear-entrance, the body in Brewster green, is also shown.

Knox Automobile Company.—With no material departure from those distinctive features, which have brought such success in the past, the Knox cars show a general improvement in minor details of mechanical design and construction, and an advance in body-making, to keep pace with the demand for more roomy and comfortable bodies. The new Model F chassis, shown without body, has two cylinders, 5 by 6 inches, 14-16 horsepower, the middle web of the crank being offset to bring the pistons more nearly into line, and to narrow the crank-case; the half-time shaft, operating valves, ignition and fan, runs on ball-bearings; sight-feed lubricating apparatus is fitted and an automatic auxiliary air intake. The fly-wheel is open, with arms forming a fan which draws the hot air from around the muffler. A steering wheel is fitted in place of the old lever system.



IN THE GARDEN SHOW, LOOKING DIAGONALLY ACROSS THE MAIN HALL—NOTE LACK OF ANY GENERAL DECORATIVE SCHEME AND INHARMONIOUS EFFECT OF GALLERY SIGNS.

On this type of chassis is shown the Model F tonneau or phaeton with side door and running-board, wide rear seat and individual front seats; the body finished in deep blue, with black moldings and yellow stripes, the chassis being in yellow and black. A cape cart top is fitted, with a short curtain dropping from the front edge and lapping over the top of the glass front, side-curtains giving complete protection from rain. The glass front is in two sections, the lower fixed and the upper so hinged to it as to fold down when not required.

The Model F 3 car, is shown on the same chassis with the new convertible body; two large individual front seats, and a rear folding seat that, when open, has no appearance of a temporary expedient. The two sides of this seat are detachable, being stowed under the cushion when the seat is closed; when in place, they form with the deep back and side doors, the ordinary fixed surrey or phaeton seat, but when the back is closed the rear portion of the body is of the conventional box form, with special rests to which a trunk or other luggage may be strapped. Unlike many convertible cars, this one shows correct proportions whether adjusted for two or four persons, and both front and rear seats are large and comfortable. The bonnet, of conventional form, gives the appearance now generally sought, though its only use is for storage, and there is another large space under the rear seat. This body is finished in green, with black moldings and yellow stripes. With a wheel-base of 87 inches there is an easy entrance to both seats, and the total weight is but 1,900 pounds.

The Model F. I. doctor's runabout, with folding front seat is shown, either wheel or

lever steer being fitted, the body being in green; there is also a Model C, single-cylinder car.

Locomobile Company of America.—Though the steam car is still built at Bridgeport, it has no place this year in the large exhibit of the Locomobile Company, every inch of the space being devoted to the new patterns of gasoline cars. The good work which has made the reputation of these cars, begins with the purchase of materials to the company's specifications as to chemical and physical properties, which must stand exhaustive tests at the shops before going into the hands of the workmen. At the outset serious difficulty was experienced in obtaining material, such as the axle forgings, and many other parts, which would stand the necessary tests, but the continued demand has at last been met by the manufacturers in various lines, who are furnishing material in which compliance with the tests is the rule, where it was at first the exception. The marked advance in this respect on the part of steel manufacturers and others, has greatly facilitated the efforts of the company in turning out large numbers of cars of uniform high quality.

The new models of the year were so thoroughly described in a recent issue of THE AUTOMOBILE, that it is only necessary to note the leading features. There has been no attempt at radical changes in proportions or mechanism, but there is a constant effort toward the reduction of weight and increase of strength by small refinements and alterations in all parts. The wheel-base has been lengthened, but only enough to give a side-entrance, ease of turning being constantly in view. Larger tires, longer springs, and larger brakes, the latter fitted with a special make of fiber on the drum, represent improvements that will be appreciated on the road. One small but important detail is the addition of stuffing-boxes to the gear-cases, preventing the oil from working out. The drop-forged I-section axle is used, with pressed steel frame, on all but the 20-25-horsepower chassis, in which the channel bar construction is retained. The most important novelty is the general use of the make-and-break system, with magneto, doing away with all batteries, coils and practically all wiring. The company still follows its practice of under-rating the horsepower of its motors.

The bare chassis of the 15-20-horsepower car is shown, highly polished, being driven by electric motor. The bodies are of wood throughout, all with side doors, running-boards and sprocket steps; the pressed metal dash is used. The 40-45-horsepower car and also the 30-35-horsepower, are shown with limousine bodies, side doors, in Brewster green; the 30-35-horsepower is also shown in French gray with bright red stripe, upholstered in red leather. Two styles of the 20-25-horsepower are shown, a coupé in maroon and black, and an open phaeton in royal blue and French gray. The smallest car, 15-20 horsepower, is shown with open phaeton body, finished throughout in white with a fine gold stripe, the upholstery being in red leather; a cape top is fitted.

Lane Motor Vehicle Co.—The Lane steam touring car has been brought up to date by a side-entrance tonneau body and a new boiler. The latter has steel tubes of about five times the usual capacity, so that the flame will burn freely within the tubes. The feed water enters the upper part of a flash coil and passes out at the bottom as steam and water into a centrifugal separator at the side, from which the steam passes to the upper part of the shell and the water to the lower part. Steam is drawn from the top of the shell and the water level is maintained by a thermostatically controlled by-pass. This may be cut out in an emergency by closing a single valve and a hand by-pass or an independent auxiliary steam pump may be used. The entire arrangement of the boiler is claimed to combine the power of the fire tube boiler with the economy of the flash tube boiler.

The engine, including the attached pumps, is enclosed and runs in oil. There is a one-piece simpling valve, which converts the engine from compound to single expansion, increasing the power from two to three-fold in case of emergency. The condenser is of a new and improved pattern and is carried in front.

Lozier Motor Co.—The new Lozier car, which marks the début of this firm of launch and launch engine builders into the automobile industry, is shown in the 30-35-horsepower model. Unavoidable delays in connection with the space at the show made it necessary to exhibit the demonstration machine which has been put through considerable hard usage, and which was hurriedly fitted with the most available body, which, unfortunately, is of the rear-entrance type, whereas the cars to be supplied for 1905 will be regularly fitted with side-entrance bodies. The car is of the four-cylinder vertical, motor front type, with pressed steel frame, mechanically actuated valves, self-contained cone clutch, sliding gear change-speed furnishing three forward speeds and side chain drive. The car, which at once takes its place among the best of American production, was fully described and illustrated in THE AUTOMOBILE for December 31. In addition to the complete car, the company shows a separate engine, which is constantly surrounded by a group of interested visitors to the show.

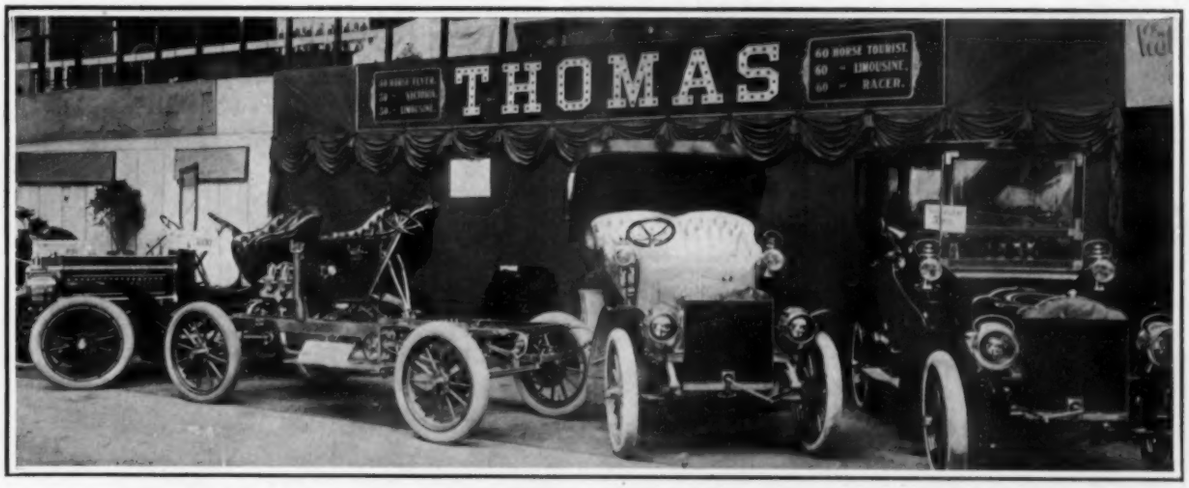
Matheson Motor Car Co.—This firm is another one of the many who show a side-entrance tonneau, both the complete car and a chassis being exhibited. One distinctive feature of this car is that it is self starting from the seat by means of a make and break ignition, the patents for which are owned exclusively by its makers. This is accomplished by an auxiliary rod engaging with gears attached to the cam shafts so that by pressing a lever on the dash it makes and breaks the contact in the cylinder which is next to explode. This produces the same effect as turning over the engine by means of the crank and making the spark in each cylinder in succession until the one under compression is reached, but with much less labor. This car was originally designed with the valves in the heads of the cylinders, which feature is still retained. Another feature is an automatic carbureter, which the exhibitor says will successfully vaporize any grade of gasoline. Another patented device is the individual clutch transmission by which the change of gear is accomplished instantly without passing through any intermediate gears. Not more than one clutch can be engaged at a time, and it is impossible to put in a second clutch until the one previously engaged has been brought to the neutral point. It is possible to change directly from one speed to any other, or to the reverse, all by the operation of one lever, which controls the change-speed gears and the clutch simultaneously.

The car is built in two models, of 40 and of 24 horsepower respectively, the only difference being in the size of the engine. The larger car is guaranteed to run at the rate of 50 miles an hour under normal conditions, and the smaller one at 40 miles an hour. The 40 horsepower was shown complete and the 24 horsepower by a chassis.

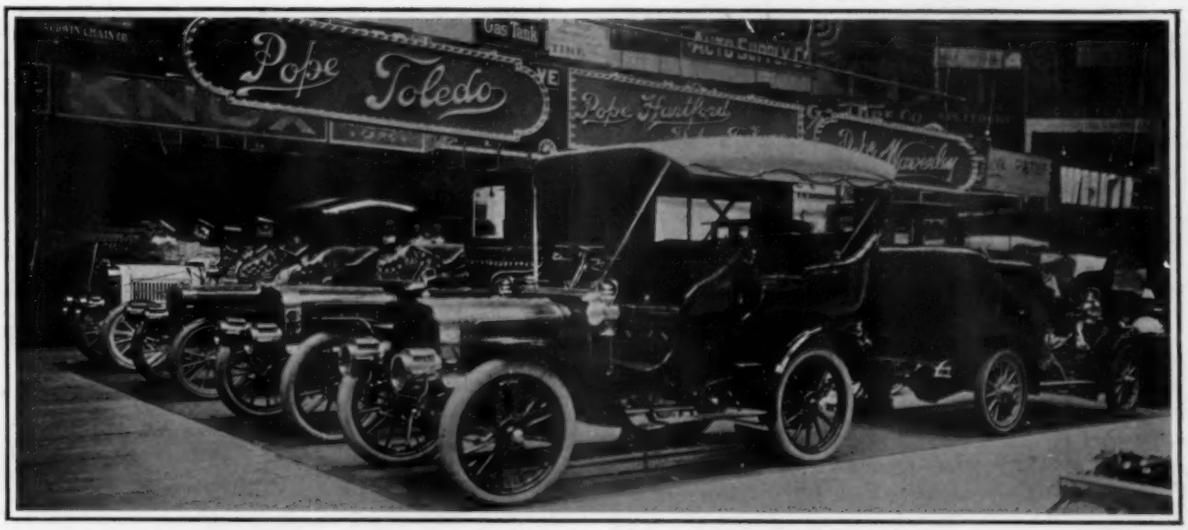
Mitchell Motor Car Company.—The side-door phaeton with four-cylinder motor, 18-20-horsepower, has a pressed steel frame, on 90-inch wheel-base, sliding gear transmission, with three speeds and reverse, the body finished in blue with yellow chassis and wheels. The smaller car with two-cylinder motor under hood, 9 horsepower, is also built this year, with pressed steel frame, the wheel-base being lengthened six inches to a total of 76 inches. The three speeds and reverse, are controlled by a single lever. It is finished in the same colors as the larger car. Both are attractive in design, with well modeled hoods, wheel steer and comfortable seats. A force-feed oiler is fitted to all motors.

National Motor Vehicle Company.—The exhibit of this company, which was delayed in transit and did not arrive until Tuesday morning, comprised a new gasoline touring car, the chassis of the same and two electric vehicles, the National runabout and the National stanhope. The gasoline car, which is entirely new this year, has a four-cylinder motor 24-34 horsepower. The four cylinders being 4¼ by 5, vertical, and individually mounted. The valves are mechanically operated, the gear pump direct driven, and the distributor gear driven. There is a divided aluminum crank case and all parts are interchangeable. The clutch is self-contained, comprising an aluminum cone, leather faced and spring cushion.

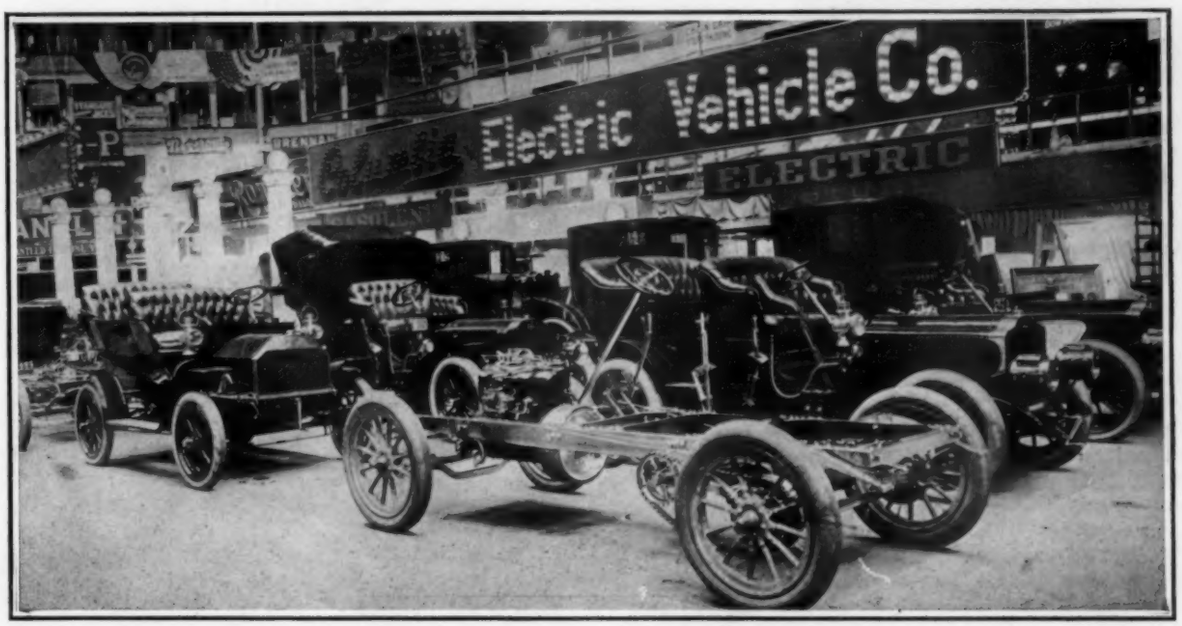
The transmission is of the sliding gear type with three speeds forward and reverse running direct on the high speed. There are double self-contained ball bearings and the gears run in oil. The ignition is by



THE THOMAS STAND AT WHICH ARE EXHIBITED ENCLOSED AND OPEN CARS AND FINISHED CLASSIS.



EXTENSIVE EXHIBIT OF THE POPE INTERESTS, INCLUDING ALL STYLES OF GASOLINE AND ELECTRIC CARS.



COLUMBIA OPEN AND CLOSED CARS AND CHASSIS WITH SECTIONED MOTOR, SHOWN BY ELECTRIC VEHICLE CO.

jump spark with one set of dry cells and a set of storage batteries in connection with a dynamo. There are two systems of brakes, internal expanding metal to metal rear hub brakes applied by a hand lever and a constricting band metal to metal brake on the driving shaft. Applying either brake releases the clutch. The steering is by a hand wheel and an inclined post, worm and gear, with a non-reversible check. There are ball joint connections to double connection rods in the front and rear of the forged knuckles. A single lever at the driver's right controls all the speeds. In changing speeds the clutches release automatically.

The cooling system comprises a cylindrical, cellular cooler with a ball bearing fan, the circulation secured by a gear pump. The bonnet is semi-cylindrical, hinged at the top and sides. The wheel-base is 98 inches and the tread 54 inches. The gasoline capacity is 15 gallons, the water capacity 5 gallons, and the speed from five to forty-five miles. The body shown was a removable high-backed tonneau of the platform type with divided front seats and a carrying capacity of five passengers.

The newer of the two electric vehicles shown was a divided battery runabout, which was exhibited for the first time at the show last year. The battery in this model is divided, part being carried in front of the vehicle and the remainder in the rear. The battery compartments are sufficiently large to carry either sixty Edison cells or forty of the Exide cells. The other electric vehicle shown was the well-known National stanhope.

Northern Mfg. Co.—The Northern touring car, which made its first appearance at the show of last year, is again exhibited with a side-door entrance to the body and a number of other improvements in the general direction of increased strength and power. The engine power has been increased from 15 to 18 horsepower, the weight to 2,000 pounds. There is a new rear axle, with four internal struts cast integral with the axle case. Other characteristic features of the car are that the cylinder is cast complete in one piece and the water jacket extends over the entire cylinder and head. The crank case and transmission gear case are combined in one casting, and these properly assembled form the complete driving mechanism of the car and rest on a three point support. The double opposed transversely placed horizontal engine is retained. The transmission gear is of novel construction, as it differs from ordinary gears of this type in having no delicate internal gears. The removal of all rods and levers from the side of the car, leaving an unobstructed space for entrance and exit, which was such a feature of the construction last year, is also retained, the clutch and spark advance levers being mounted upon the steering column.

A chassis of the touring car is also exhibited, together with the well-known Northern runabout, which, while retaining all the operating mechanism used in the similar model of last year, has been greatly improved in the minor details of its construction. In the early models all of the machine was enclosed within the body, but the muffler has now been dropped beneath the body in order to eliminate the heat occasioned by this device. In the space formerly occupied by the muffler has been placed a large water tank which affords a running capacity of from 300 to 500 miles without refilling. The price has also been reduced from $750 to $650.

Olds Motor Works.—The handy little car with which this company first established its world-wide reputation is shown with little change from last year except the addition of a new carbureter, which has added materially to the power. The rear-door tonneau, new last year, is also shown with an attractive coloring of sage green for the body. Between them in size and price is the new touring runabout, with single-cylinder horizontal motor below the frame, but square bonnet and honeycomb cooler to give the appearance now generally sought. There are two good individual seats, with wheel steer.

The 10-horsepower delivery wagon is shown, with a new and larger car of 16 horsepower, having a two-cylinder motor in front; the body has a capacity of 87 cubic feet.

The principal feature of the Olds exhibit is, naturally, the new touring car of 20 horsepower, with side entrance, with a wheel-base of but 90 inches. Special attention has been devoted to obtaining footroom within the body and an ample door width. The doors open backward, and the lower hinge on each is of great length, so that the door is entirely out of the way in entering. Separate steps are used in front and rear. The horizontal motor is readily accessible from the floor. The car has a wide rear seat for three, and individual front seats, body finished in deep blue with white stripe, and yellow gear and wheels; upholstered in black leather.

Phelps Motor Vehicle Company.—The peculiar construction of this car was very fully described last year, there being no chassis, but the motor and driving mechanism serving to connect both axles; a special feature is the facility with which the body may be raised at the front end to admit of access to the mechanism. No material change has been found necessary this year, though a minor improvement has been made by the addition of a counter-balance to the triggers of the friction clutches, so that there is no possibility of a trigger, when idle, being thrown by centrifugal force and causing needless friction. The body design is new throughout; the wheel-base has been lengthened to admit of a side-entrance body, and to give more room in front of the driver's seat, as well as to admit of a water-tank within the pressed steel dash. The rear end is suspended on platform springs, giving great ease of motion. The body is handsomely modeled, with wide, high-backed rear seat, raised sufficiently to give a space for an extra tire beneath the floor. It is finished in rich blue, with black mouldings and yellow stripe, the gear and wheels being in yellow and black. A good deal of attention is given to stowage; there is a large space under the rear seat with a trunk rack behind the body; coat racks are attached to the backs of the rear seats. Under the front seats are arranged small drawers for springs and other small parts, and there is additional space for general stowage. The running-gear is shown separately and also one completed car.

George N. Pierce Co.—Five complete cars were shown by this firm, all of which are new with the exception of the Pierce standard stanhope. Three of the new cars have a 28-32-horsepower chassis mounted respectively with a landaulet body, a touring body with a cape top, and the third being the so-called suburban body of the limousine pattern; the other is a 24-horsepower chassis, which was shown with a victoria top. New features this year include a change in the position of the carbureter, the float and spray chambers being placed side by side, instead of the spray in advance of the float, as was the case last year. The newer arrangement renders the carbureter less affected by changes of level, as in ascending a hill. Another new feature is the rotary oil pump connected directly beneath the engine case and positive in its action. A rotary water pump has also been added.

Truffault-Hartford shock absorbing devices are fitted on the springs of all the Pierce cars this year. The bodies all have the side entrance except the stanhope. Wings on the inner side of the mud bars, extending vertically downward, prevent the throwing of mud upon the body of the car. Another new feature is a recessed dash, with two lockers on the inner side. This dash also carries the auto-coil with five coils, any one of which may be substituted in case of accident while touring, four operating regularly and one being held in reserve.

Other features of Pierce construction retained in this year's model are the chainless drive direct connection through transmission gears to the wheels of the car, and protection of all working parts. The power plant of the car, which is known as the "Great Arrow," to distinguish it from the "Arrow," which preceded it, consists of a four-cylinder vertical water-cooled motor with mechanically operated valves, of either 24-28 horsepower or 28-32 horsepower, the increase in power being produced by a difference in the dimensions of the cylinder, those of the 24-28 car being 3 15-16 inch in diameter by 4 3-4 inch stroke, while that of the 24-28 model is 4 1-4 inch diameter by 4 3-4 inch stroke. The wheelbase of the smaller car is 100 inches and that of the higher powered is 104 inches.

Ignition on both is by jump-spark, high tension, with four independent coils, one in reserve, and two sets of storage batteries. The carbureter is of the special Pierce automatic type, requiring no hand regulation of gasoline or air, and gives a proper mixture for all speeds and conditions. The speed control is by an automatic governor, the throttle lever not acting directly on the throttle valve, but varying the governor spring resistance, thus leaving the governor always in full control of the motor speed and the car speed. The car cannot exceed the rate fixed by the governor, as determined by the position of the throttle lever. There is no separate accelerator lever or foot button.

All speed control levers are on the steering post close under the wheel. The throttle and spark levers can be operated without taking the hand from the steering wheel. The car has only one outside lever, which is that for applying the emergency brakes. The other three controlling levers are on the steering post. The speed change mechanism is a sliding gear on ball bearings. Before the slide can be moved to change the gear the motor clutch must be disengaged, then as all gears are free, and on ball bearings, a very slight contact makes the two gears take the same speed.

The oiling system has no sight feed regulation valves, but has large pipes through which a constant flow is maintained from the oil tank bolted to the top of the cylinder. This position of the oil tank prevents the congealing of the oil in cold weather. There is a glass oil gauge on the dashboard, with an electric light to illuminate it at night. The shaft drive is to a live rear axle, with large ball bearings running in oil in dust-proof case; the radiator is of the tubular disc pattern with combined water tank, and is located in front of the engine and provided with a fan.

Pope Motor Car Company.—One of the largest spaces in the center of the main floor is filled with the various exhibits—gasoline and electric, and ranging in price from $500 to $6,000—of the various Pope plants. In price, speed, capacity and style, this exhibit appeals to probably a larger number of motorists than any other in the show. The Pope-Toledo factory shows three styles of its cars—20, 30 and 45-horsepower—all with four-cylinder motors, and the two larger, with applied jackets of corrugated copper, as built for several years; the 20-horsepower has the cylinders in pairs, with integrally cast jackets. This year the motor suspension has been changed by the addition of an under-frame. The largest car is a phaeton, of 45 horsepower, with swelled back of the *Roi des Belges* type, built partly in wood and partly in steel; with side entrance from a running-board and sprocket step. It is finished in white, both body and chassis, with black molding, the upholstery being in green leather; a victoria top is fitted. The interior is fitted up with pockets for toilet articles, maps and papers. A new feature is a pressed-steel dash lined on the rear side with a handsome mahogany panel.

One 30-horsepower car has also a phaeton body, with cape top of silk canvas. The body is of the *Roi des Belges* type, with curved side doors and individual front seats, the finish being in dark blue throughout with white stripe and red leather upholstery. The other 30-horsepower car has a landaulet body in black with upper panels in maroon, striped with gold. The interior is upholstered in purple cloth; the front seat in black leather. Electric light, pockets, etc., are fitted. The 20-horsepower car has a side-entrance body in blue, on yellow chassis, upholstered in brown leather.

GENERAL VIEW OF THE CADILLAC DISPLAY, PHOTOGRAPHED FROM THE ARENA PLATFORM.

The Hartford plant of the company, making the Pope-Hartford cars, shows the regular 10-horsepower car of last year, with horizontal motor under the center of the body, and also an entirely new model, of 16 horsepower, with double-opposed motor under the hood in front. The former car has a rear-door tonneau body, finished in blue and yellow. The new car has a phaeton body with easy side entrances. The mechanical features are interesting; the motor has 4¾ inches bore by 4½ inches stroke, water-jacketed cylinders, with direct drive by central shaft and bevel gears. The frame is of oak, armored with steel. The change-speed gear has three speeds forward and reverse, with sliding gears very care-

fully designed to give strength and long wear. The connection with the bevel gears is by squared shaft and slip-joint and cardans, the latter well shaped to give ample strength. The bevel gear wheel and pinion are of good size, and a special spur gear differential is fitted, with the pinions free and moving in cages. The rear axle is in two halves, the squared ends fitting into the sockets of the differential. Both differential and change-gears are shown apart from the finished cars, and are well worth inspection, the design promising strength and durability beyond the power of the motor. The steering wheel is fitted on a post with a fashionable amount of rake, the wheel carrying the control handles; the bonnet is of stylish proportions, and a long running-board gives easy access to the front and rear seats. An automatic oiler is fitted, with Kingston carbureter.

The Pope-Tribune car, built at the Hagerstown, Md., plant, made its debut at the last Show as a $500 car with seat for two; this year it has expanded to a side-door car at $900, and a very roomy and attractive car for the price. One of the smaller cars, 6-horsepower, is shown finished in sage green. The larger, of 12-horsepower, has a two-cylinder, vertical, water-cooled motor under the hood. The drive is by central shaft, with three speeds and reverse by individual clutches. The hood is of modern outline, with cellular radiator. The body is roomy and comfortable, seating two in each seat, with running-board to front and rear seats. The steering is by wheel, irreversible. The body is finished in Cumberland blue with cream chassis and wheels.

The Pope-Waverley factory, at Indianapolis, shows, among other electric cars, a new speed runabout, designed to sell at $900, without top, and to make from eighteen to nineteen miles per hour. The body is finished in black, with yellow wheels; the batteries include 30 cells, giving 60 volts. The Waverley stanhope is shown in plum color throughout, with continuous fenders forming a long step. The coupé-top Chelsea is a very useful and handsome car, the top, with large glass windows and full door with glass, being quickly removable to make an open car. The finish is in Brewster green with coach-red gear and wheels, the upholstery being in dark green leather and the top finished in broadcloth of the same color. Fixtures are fitted for a victoria top when the coupé top is removed.

The Waverley station wagon carries two on each of the seats, steering with a lever on the near side; two motors are fitted, with 40 cells in the battery. The body is in black with Brewster green panels and the gear and wheels are in coach-red; the interior is upholstered in dark green broadcloth and the front seat in dark green leather. Owing to lack of space, none of the company's commercial vehicles are shown.

Prescott Automobile Mfg. Co.—The Prescott steam automobile for 1905 follows the regular lines of previous models, though a number of improvements have been made in minor details. Prices have been materially reduced, the $1,100 car of last year selling for $800 this year, while another is priced as low as $650.

Reliance Motor Car Company.—The Reliance car, which is the product of the newest Detroit automobile factory, is a five passenger touring car, with a side-entrance body, built along high class lines. It was exhibited for the first time. The motor is of the horizontal double opposed cylinder type of 16 horsepower. The transmission is of the sliding gear type. The motor control is by a throttle lever on the steering post and a foot accelerator, affording any desired increase of fuel. Lubrication of the motor and valve mechanism is secured by a positive force feed system. The transmission, friction clutch and connected parts run in an oil bath. The water circulation is effected by means of a direct driven double acting rotary pump, supplying water independently to each cylinder.

Royal Motor Car Company.—The Royal Tourist car was fully described on the occasion of the last Show, at which it made its debut, in a very radical evolution from an older car; this year the general form, with four cylinders on a pressed-steel chassis, sliding-gear transmission and central drive, is retained; but many improvements have been made in proportions and details. The cylinders are 5 by 5½ inches, giving 32-38 horsepower. The Royal carbureter has been further improved, as has the commutator, running in oil with force-feed down through the vertical driving shaft to the gears. The wheel-base has been lengthened to 108 inches, giving room for a side-entrance body, a running-board and sprocket step on each side, leading to the doors; the wooden dash has been replaced by a new form of dished aluminum casting. All the valves are mechanically operated and interchangeable; internal expansion brakes are used, with positive force-feed lubricator. A chassis finished in yellow is shown, with a complete car finished in royal blue for the body, over a yellow chassis. Good stowage space, large tool-box and special tire compartment are provided.

Smith & Mabley.—This firm, which is a very large importer of foreign cars and has usually occupied a large space for its display at the previous shows in the Garden, exhibits this year only a trio of Smith & Mabley Simplex cars, the foreign exhibit being at the Importers' Salon in the Herald Square Exhibition Hall. The Garden exhibit comprises an extension brougham, a special Smith & Mabley touring car, and a chassis with the rough finish, just as received from the factory. The firm, however, regularly makes no less than nineteen different styles of bodies for its cars, designs of which are shown.

Of the two cars exhibited the touring car shows the most interesting novelty in an arrangement of auxiliary seats placed in the front of the tonneau opposite the side entrance on either side. These seats have a folding iron frame, which is connected with the doors, so that when either door is open the corresponding seat folds back and out of the way. When the door is closed the seat descends and locks in place. This device adds very much to the seating capacity of the car, as seven persons can be comfortably accommodated, three on the rear seat, two upon the folding seats and two upon the front seat. By the removal of the two bolts either seat may be removed from the car.

An interesting feature common to both the cars shown is the long body length in proportion to the wheel base, the wheel base in both cars being 106 inches and the body length 90.6 inches. Another feature to which the makers draw particular attention is the fact that all the bearings in the transmission and counter shaft are imported German ball bearings, exactly similar to those used in the Mercedes cars and made by the same makers. Still another distinctive feature is the special form of spoke used, which also resembles the German type, the lower portion which enters the hub being made at an angle so that when the side clamps are applied it is impossible to withdraw the spoke, even after the rim is removed. Although spokes of this kind are made by machinery abroad, it has been found necessary to make them by hand here. The car also follows the German construction in a number of other respects. The pedals are of the German type and the spark and throttle are located on the steering wheel, as in the German system.

The brougham shown is described by the makers as a return to the horse carriage model, the body being that of a regular extension front brougham, the use of which is permitted on account of the compactness of the chassis. In this connection attention is called to the fact that the Smith & Mabley Simplex chassis is very compact and the motor develops fully 34 horsepower. A crank case with the cylinders removed to show the internal operation was also exhibited.

Springer Motor Vehicle Company.—The new car of 1905 is entirely different in many features, from that of last year. Though showing a large bonnet in front, the motor is still under the center of the car, but so arranged as to be readily accessible. There are two separate motors, each double opposed, with all parts duplicated; in case of accident to either, the flywheel may be disconnected from it, so that the other will still run alone. When access is required to all the gear, the body may be lifted on hinges at the rear. An expanding clutch is used, running in oil, the motor driving to the gear case by the Renold chain,

and two side chains connect the rear wheels to the solid jack-shaft, the differential being separate from the shaft and attached to the gear case.

A special feature is the arrangement for cutting out any one or all of the four cylinders, by lifting the exhaust valve, the operating levers being on the dash within easy reach from the seat. A very complete control of the motor is claimed. Two pumps are fitted; the space under the hood is utilized for a large gasoline tank and for the batteries. The body has a high curved back with wide side doors, approached from a running-board and sprocket step. Three may find room on the rear seat, and two extra seats are fitted, the lazy-back for each, folding down into the inside of a door. The rear part of the body is detachable, leaving only the front seats. The glass front slides down out of the way and when lowered its upper edge is covered by folding guides of brass; in raising the glass, these guides are first swung upward, forming a support for the glass.

GENERAL VIEW OF FRANKLIN EXHIBIT SHOWING 20-HORSEPOWER MODEL, WHITMAN'S TRANSCONTINENTAL CAR AND SEPARATE ENGINE IN FOREGROUND.

The power of the motor may be varied from 12 to 30 horsepower, by cutting out the cylinders, there being no compression and no waste of gasoline, when the cylinder is not working. The body is finished in deep green, with black moldings and a triple white stripe. The exhibit also includes a delivery wagon with two cylinders, of 12-14 horsepower, with large enclosed body.

Standard Motor Construction Company.—The new marine type of open-base motor, of 24 horsepower, introduced last year by the Standard Motor Construction Company, and used this season in both cars and launches, is shown on a new chassis with 108-inch wheel-base, to carry the latest style of side-entrance body. This company now builds only motor and chassis, fitting such bodies as the purchasers desire; the one shown is of graceful design, with wide rear seat for three, and individual front seats, finished in robin's-egg blue, with chassis and wheels of the same color, relieved by black bands on hubs and black stripes on fenders; the interior upholstered in bright red leather. The rear springs are 48 inches long, the front ones 40 inches; the body is entered from a running-board. One change is from the cellular cooler to the coil pattern. The fan is driven by a Renold silent chain. The company is now fully occupied with work on marine motors, some of them of very high power, and it is turning out but one size of car, and this only to the extent of motor and chassis, any form of body being fitted to suit the purchaser.

F. B. Stearns Company.—The new model Stearns car, shown for the first time, is an entire departure from the well-known practice of this company in the line of the double-opposed horizontal motor, under the body, with armored-wood frame. The new frame is of pressed steel, the motor is a four-cylinder vertical, placed in front, the wheel-base is lengthened to 111 inches, and the latest pattern of side-entrance body is fitted. The motor and chassis, as well as the body, are new throughout, and all of their features would require more time and space than is possible, in the opening days of a show. The pressed steel frame is of the latest pattern, carried on I-section axles, by 48-inch rear springs and 40-inch front springs. The wheels have the ball-bearings so long used in the Stearns cars; the rear hub castings expand into large flanges to which are bolted the sprocket and brake drum; the latter fitting over an internal drum and expanding band, fast on the rear axle. The pull of the side chain is almost exactly in the plane of the inner balls, 7-8-inch diameter.

The motor has cylinders 4 7-8 inches by 5 7-8 inches, cast in pairs with integral heads and jackets; the case is a single casting of aluminum, with three arms on a side attached directly to the main side members. The crank-shafts are worked from the solid billet, the bearings are of generous length and ground true. The clutch has an external band embracing the flywheel hub. The sliding-gear transmission gives four speeds forward and reverse, gearing to bevel wheel on jack-shaft. The dash is an aluminum casting of special pattern, and a similar casting forms a frame for the radiator, protecting it from injury; the two being joined by the sheet-metal hood. The water pipe from the motor is also an aluminum casting. The speed-change device demands a longer and more detailed description than is now possible. The gasoline tank, of 24

gallons capacity, is slung under the rear end of the chassis, where filling from the outside is easily possible. Jump spark ignition from magneto is used.

The body is a side-door phaeton, with running-board and sprocket step, finished in Brewster green, with black moldings and fine red stripe, the chassis being in automobile red. The upholstery is in black leather, and a leather victoria top is fitted. Both front and rear seats are wide, deep and very comfortable. A brass handle in the form of a drawer pull, is attached to the rear of each front seat, giving a firm grasp in entering the rear part of the car. A chassis is shown separate, with all parts open to examination, in addition to the complete car.

On Wednesday a handsome landaulet was installed on the same chassis as the touring car, with body in Brewster green and black, and wheels and chassis in grass green striped with black.

J. Stevens Arms & Tool Company.—The constructors of the Stevens-Duryea show a decidedly new departure from the line which has made that car so successful, in a new four-cylinder vertical motor-front car, with pressed steel chassis and side-entrance body. The chassis is shown over a mirror, giving a good view of all parts. The motor is of 20 horsepower, with separate cylinders; a multiple-disc clutch is used, with sliding gear transmission, three speeds and reverse. The crank-case, clutch-case and gear-case form practically a unit suspended on the three-point principle, from the fore end of the motor and the rear end of the gear-case; a central shaft and bevel-gear drive are used. In addition to chassis, a complete car is shown, with side-entrance from running-board and four-bow cape top in black leather. The body is finely finished in blue, with chassis and wheels in Naples yellow. The standard type of runabout, too well-known to require description, is shown with top in a handsome body of wine color.

Studebaker Automobile Company.—Seven complete vehicles are shown in this exhibit, but interest centers in the chassis of the first high-powered gasoline car turned out by these makers. It has a motor of the four vertical cylinder type, developing 20 horsepower. The cylinders are cast in pairs and bolted to a composition base, the lower half of the crank case being removable without disturbing the crank shaft bearings. The clutch is conical, leather face, self-contained against end thrust and operated by a push pedal. It interlocks with both brakes, so that the setting of either brake automatically disconnects the engine from the driving gear.

The transmission gear is of the sliding gear type, having three speeds forward and one reverse, the high speed driving directly. All the gears are oil tempered, the larger being in the form of rings, which are easily removable for replacement if necessary. The power is transmitted by means of a propeller shaft containing two universal joints and terminating in a bevel pinion of generous dimensions engaging with the bevel gear of the rear axle. The rear axle proper is tubular, sustaining the weight of the car without contributing to the power transmission, the driving being done by a squared end shaft extending from the balance gear to the outer end of the rear wheel hubs, with which they are engaged by means of fingered clutches. The wheel bearing and rear axle bearing are two-point ball bearings, with provision for adjustments.

There are two sets of brakes, one operated by a foot pedal, the other by a side lever. The oiling system is automatic force feed with sight feed on the dash-board. The ignition is of the high-tension jump spark type from two sets of storage batteries and a direct current generator, any one of which may be put in circuit at will by means of a three-point switch on the induction coil.

The water-cooling system consists of a honeycomb radiator and a positively driven centrifugal pump. Steering is of the irreversible wheel type. The throttle and spark control are located on top of the steering wheel. A notable feature is a pressed steel recessed dash, inside of which are located the spark coil, sight feed and the ignition dynamo, the latter driven by a friction pulley from the engine fly-wheel, which is directly beneath it. A sheet aluminum pan extends beneath the entire working mechanism, and is easily removable and easy to keep clean. A muffler of unusually large capacity is used, which results in a particularly rapid cooling of the products of combustion.

Another new car shown is a gasoline touring car with a side-entrance tonneau body and a 16-horsepower, two-cylinder horizontal motor, each cylinder being 5 by 5½ inches. The valves are from steel forgings, and are all mechanically actuated. The lubrication is by forced feed oil with sights located on the dash where the coil also is placed. The planetary gear is employed and the transmission is by roller chain. The steering is by wheel and irreversible. A foot-controlled throttle regulates the speed within wide limits. There are roller bearings on the transmission and axles and elsewhere plain bearings of extra large dimensions. There are two separate and independent separate sets of brakes. The frame is of armored wood, the wheel-base is 82 inches and the tread 56½ inches. The speed is from four to thirty-five miles an hour. A car of similar type, but with a rear-entrance tonneau body, was operated outside the garden.

Six electric vehicles were also shown, including the Studebaker electric victoria phaeton, the Studebaker electric runabout, a special high-speed electric stanhope with an average mileage, per charge, of 50 miles and a speed of 3 to 18 miles per hour, a delivery wagon of 1,000 pounds capacity and an electric truck with a stake body of 2,500 pounds capacity.

E. R. Thomas Motor Company.—The Thomas cars of 1905 show a further advance over the greatly improved cars of last year; the general construction with pressed steel frame, vertical motor in front, special change gears, with no gears in mesh on direct-drive high speed, is retained, with the pressed-steel dash first introduced on this car and the ratchet device to prevent running backwards. The three-cylinder motor, however, has been replaced by a four and a six, each cylinder separate; improvements have been made in such important details as bearings and valves, and special attention has been given to the two vital points of accessibility of parts and general simplicity of mechanism. The improvement is by no means confined to the chassis and motor, but the body design has been revised, with three ends in view; graceful form, roomy and comfortable seats—with side-entrance—and a maximum of stowage space. With the more roomy bodies are more powerful motors, one of 40 horsepower, one of 50, and one with six cylinders of 60; the latter fitted with a special racing body, interchangeable with the regular phaeton or limousine body for touring.

The new bodies are marked by very graceful curves, the outward swell of sides and back giving large and comfortable seats. The side doors are wide, approached from running-board and sprocket step. A special claim is made for the peculiar curve of the after-body that it throws the dust away from the car instead of rolling it in over the back. The 40-horsepower chassis carires a handsome phaeton body with side door, finished in Brewster green; the 50-horsepower chassis carries a similar body in French gray ouside, with leather upholstery to match, a victoria top being fitted. The limousine body, also shown on a 50-horsepower chassis, is of the same form as the phaeton, but with full door, large beveled plate windows on sides and in back, luggage rack on top and plate glass in front of driver. The curved back is paneled, both body and chassis are finished in Brewster green, the front seats are upholstered in green leather, and the body in a fawn-colored cloth, with ceiling tufted in satin. Electric lights and a speaking tube are also fitted.

The stowage space of these bodies calls for special mention; just back of the front seats is the "baggage-room," 27 inches wide, 25 inches high, and 6½ inches deep, left clear for suit cases or fitted with special drawers and shelves. Beneath the rear seat is a space 36 inches long, 10 inches wide and 12 inches deep. Beneath the floor of the body is first a space 33½ inches long, 31½ inches wide and 3½ inches deep, accommodating one 32 by 4 inch tire, inner tubes, repair kit and tools. Under this is the tool-box, 21½ inches long, 12½ inches deep, and 4⅜ inches high. On top of the

"baggage-room" is a rack 4 feet long, 3 inches wide and 2 1-4 inches deep, for canes, light wraps, etc. In the upholstering of each door is a pocket 8 inches by 14 by 2 inches. The hollow dash has lockers on each side, one for tools, oil can, etc., the other specially fitted for spare parts, inlet valves, spark plugs, etc. A total space of over nine cubic feet is claimed for these different compartments, with more than the usual accessibility for each.

Vehicle Equipment Company.—Along the east end of the main floor is the display of the electric vehicles built by the Vehicle Equipment Company, including some of the largest and most powerful trucks in use. While the simple and direct construction with steel body frame and pedestals of the railway car type is retained as being capable of no modification for this class of vehicle, several details have been improved. In the five-ton trucks the multiple-gear has been replaced by a 30-ampere direct drive motor with four speeds ahead and four reverse. The first two of the reverse speeds constitute a special emergency brake, operated through the controller. These trucks, with a weight of 9,800 pounds, fitted with seven-inch solid tires on the driving wheels and six and one-half inch on the front wheels, will have a radius of twenty-five to thirty miles at a speed of five and one-half miles per hour when fitted with a new battery now in preparation. One of these trucks is shown with a five-ton electric hoist, another is of the brewery pattern, and a third is for ordinary delivery. There is shown also a two-ton furniture truck, a 3,000-pound delivery wagon and a 2,000-pound wagon.

In pleasure vehicles the company shows a handsome electric victoria finished in maroon and black, the interior in maroon cloth; and also a hansom, in Brewster green for the upper panels, black below, and black leather upholstery. Within a couple of weeks the company will move into the new shops built for it on Borden avenue, Long Island City, near the Thirty-fourth Street Ferry, the largest works of the kind in the world, with 200,000 square feet of floor space. One special feature will be an electric crane by which parts and completed vehicles may be loaded on cars on sidings within the buildings.

Waltham Mfg. Co.—The latest development of the Orient air-cooling system was shown in a new 20-horsepower four-cylinder car with a side-entrance body, which was exhibited for the first time. The four vertical cylinders are arranged tandem, parallel to the length of the car, and a powerful, four-bladed fan forward of the motor drives an air blast completely around them. The flanges are cast on the cylinders and cover the entire upper part of their surfaces, including their heads, and are aligned in the direction of the draft from the fan. The valves are mechanically operated. Each piston is supplied with three close-fitting rings, giving the cylinders a most sufficient compression. The valve cams are so designed as to allow the valves to open and shut almost without noise. The shaft is drop-forged from special steel, and runs in five extra long bearings which are bushed with bronze. The lubrication of the motor is accomplished by the splash system, the lower portion of the crank case being separated by small ridges to retain the oil in each crank pit, while the car may be ascending or descending a grade. The crank case is so arranged that the lower half may be removed for access to the running parts. The clutch is of the cone pattern, with an internal contact.

The transmission is of the sliding gear pattern, with three speeds forward and reverse, and is so arranged that when the high speed is thrown in the counter shaft is disengaged, allowing the motor to drive direct. Both shafts run in ball bearings. The drive shaft has two universal joints, and drives the rear axle by a bevel gear. The entire transmission is in an aluminum case bolted to the pressed steel sub-frame, and is kept half full of oil.

The carbureter is of the Orient pattern, the lower chamber containing a metal float and automatic needle valve, which closes and shuts off the supply as soon as the gasoline reaches the required level. The gasoline then passes through to the bottom of the other chamber, from which it is drawn through small slots in the beveled screw cap of a stand pipe by the suction of the air drawn in by the motor. The richness of the mixture is governed by the movement of the mixture valve, which is connected with the lever on the dash, the quantity of fuel regulated by the throttle.

AN OLD FAVORITE, THE WHITE STEAMER, SHOWN IN LIGHT AND DARK FINISHES.—NOTE THE DECORATIVE TOUCHES.

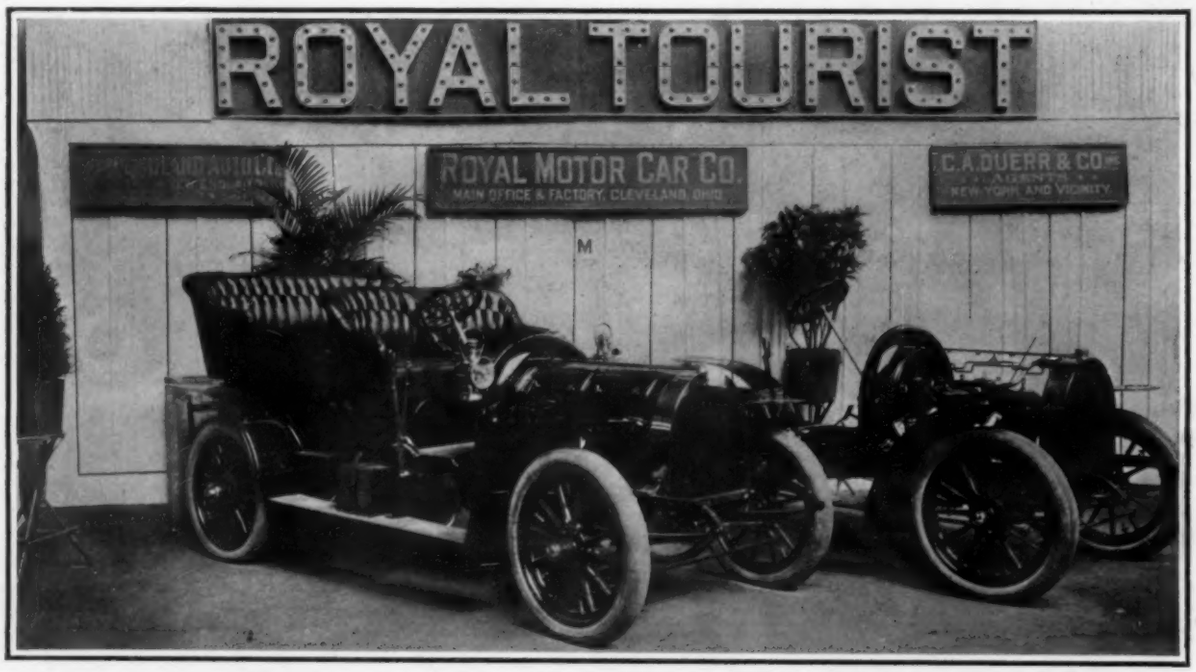
The steering wheel, of the usual pattern, carries the throttle and the spark levers, which work on sectors on top of the wheel. The transmission and emergency brakes are operated by hand levers at the right side of the car. The foot pedals are placed one on either side of the steering column; that at the left operates the clutch, and the one on the right sets the band brake on the transmission drum. The emergency brake, which is operated by the side hand lever, operates band brakes on both rear wheels. The operation of this brake throws out the clutch, disconnecting the engine and stopping the car at the same time.

The ignition consists of two sets of dry batteries of four cells each, which are wired to a four-coil vibrator and connected with the commutator on the motor. The ignition is by a jump-spark. The axles are of 2-inch tubing in front and 2 1-2 inch in the rear. The latter has two live axles of one and one quarter inches. The differential consists of four trains of beveled gears. The live axles run on ball-bearings at the inner ends, and long roller bearings at the outer ends, where the weight of the car is carried. The springs are extra long, being 40 inches in front and 45 inches in the rear.

The frame is of pressed steel, the side members being four inches deep near the center, tapering each way and curved at the ends to receive the springs. The side frames are connected by cross-members, from which is hung a pressed steel sub-frame, to which the motor and transmission are bolted. The wheelbase is 96 inches, the weight 1,650 pounds, and the speed 35 miles an hour.

A new 16-horsepower touring car is also shown, which weighs 1,450 pounds, and has the same speed as the heavier car, 35 miles an hour. The motor is four cylinder, air-cooled, and in general construction is exactly the same as the 20-horsepower motor, except that it has no governor and is slightly smaller in all its dimensions, the bore being 3 1-4 inches and the stroke 4 1-4 inches. The transmission, the carbureter, and the ignition is the same as for the larger car. The steering wheel, throttle and spark levers are also arranged the same as on the other car, but the emergency brake is operated by the left-hand foot lever, which also releases the clutch, instead of by a side lever, as on the larger car. The wheelbase is 82 inches, and the axles are of 1 1-2 inch tubing in front and 2 1-2 inch in the rear. The differential is similar in construction to that of the larger car. The body is a side entrance tonneau, similar to that of the larger car.

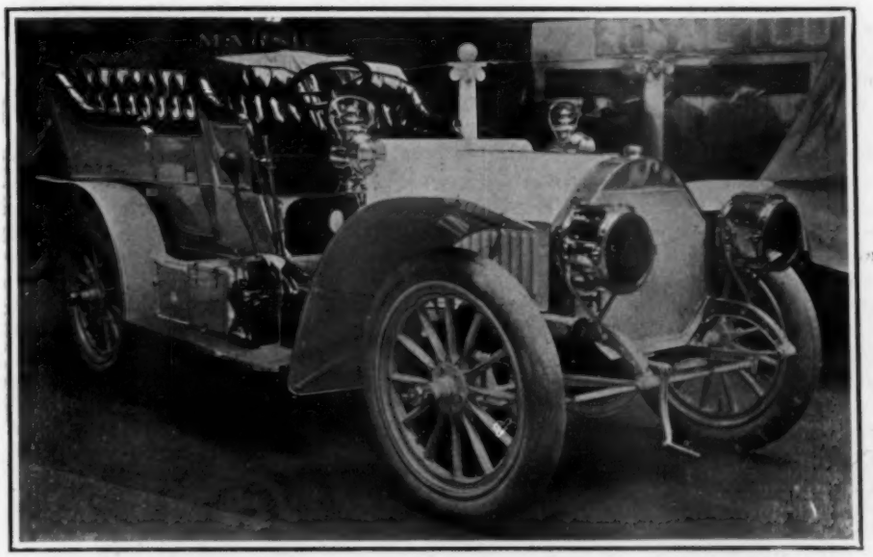
The well-known Orient buckboard, brought up to date with a few minor improvements, is also exhibited.



ROYAL TOURIST EXHIBIT OF COMPLETED CAR AND CHASSIS—NOTE NEW ROUNDED CONTOUR OF HOOD.

White Sewing Machine Company.—The White cars of 1905 show no radical features in motor or car construction, but they have the expanded wheel-base, utilized for larger bodies with side-entrance, and several minor but valuable improvements have been made in the steam plant. In addition to the strengthening of the engine in parts, a small flywheel has been added, preventing all rattle in the driving shaft. The transmission has been materially improved in detail, so that the engine may be thrown out of gear and run free, running both water and air pumps, thus avoiding the necessity for hand pumping. By this device the engine and pumps may be started before sufficient steam is generated to warrant the starting of the car, allowing the engine to warm up thoroughly. In connection with this feature, is an emergency gear, connected with the rear axle and giving about eight to one, in place of the three and one-half to one of the regular gear; the speed of the engine is thus doubled, the pumps work twice as rapidly, and double the amount of water is delivered to the generator in a given time. These gears are controlled by a single lever; in the forward position, the engine is connected at the ordinary gear, in the middle position the engine runs free, the car remaining at rest, in the extreme backward position, the eight-to-one gear is in. Another valuable detail is the addition of a second water pump, with by-pass to both; either pump may be instantly thrown into use; giving double security against accident. The standard touring car of 1905 has an engine of 15 horsepower, with 93-inch wheel-base; one car shown, has a rear-door tonneau body, the body and wheels being finished in white, with a fine red stripe; the seats upholstered in russet leather. A handsome rear-door limousine is shown, with the same engine, the lower part of the body finished in dark blue, the panels in sage green with black mouldings and yellow chassis and wheels. The rear accommodates four persons and there is one wide front seat.

Winton Motor Carriage Company.—The Winton stand never lacks a crowd of spectators throughout the full period of the Show, and this year the usual interest is heightened by the presence of Winton cars with vertical-four-cylinder motors in front. In making this great change to the majority side, there is a marked departure from conventional and accepted lines. With a view to securing the same accessibility which has long been a notable feature of the



LOCOMOBILE NEW MODEL 30-35 HORSEPOWER SIDE ENTRANCE OPEN CAR.

Winton cars, the crank-case is divided vertically instead of horizontally, the near side being readily detachable by the removal of a few nuts. With it removed, the crank-shaft and connecting rod ends are open for inspection, for setting up of bearings, or for the removal of connecting-rods and pistons; the main part of the engine and all connections being undisturbed. Where only an ordinary inspection is necessary, the half of the case is left undisturbed and one of two hand-hole plates is removed, exposing the connecting-rod ends. The pressed steel side members carry a steel dust-pan permanently attached, no provision being made for getting at the motor from beneath. The drive is by central shaft to bevel gear connection with the rear axle, the change-gear case containing individual clutches of the well-known Winton type, two speeds forward and reverse.

The lubrication is by means of a new type of oiler, arranged on the plan of the ink distributor on a printing press; the oil is received from the tank in a float chamber, which maintains a constant level in a long trough just below an aluminum roller about one inch in diameter, driven by gearing from the main shaft. The film of oil taken up by the lower side of this roller, and which may be of varying thickness, according to the temperature, is brought to a uniform thickness by means of a blade, set closely in contact with the cylinder; on the other side of the cylinder a similar blade serves to scrape off the oil and lead it to the openings of the series of pipes by which it is carried directly to every bearing. There is no splash lubrication, the oil being piped in this way to each point, including the connecting-rod bearings on the shaft. With no moving parts and no pressure, this lubricator is easily adjusted to any thickness of oil; and when in operation it feeds in proportion to the speed of the motor; giving an absolutely uniform feed. The Winton air regulator is retained, magneto ignition is used, with gear drives, and all the other meritorious features of the older cars are present. The gasoline tank is placed in the rear, where it may be easily filled from without the body.

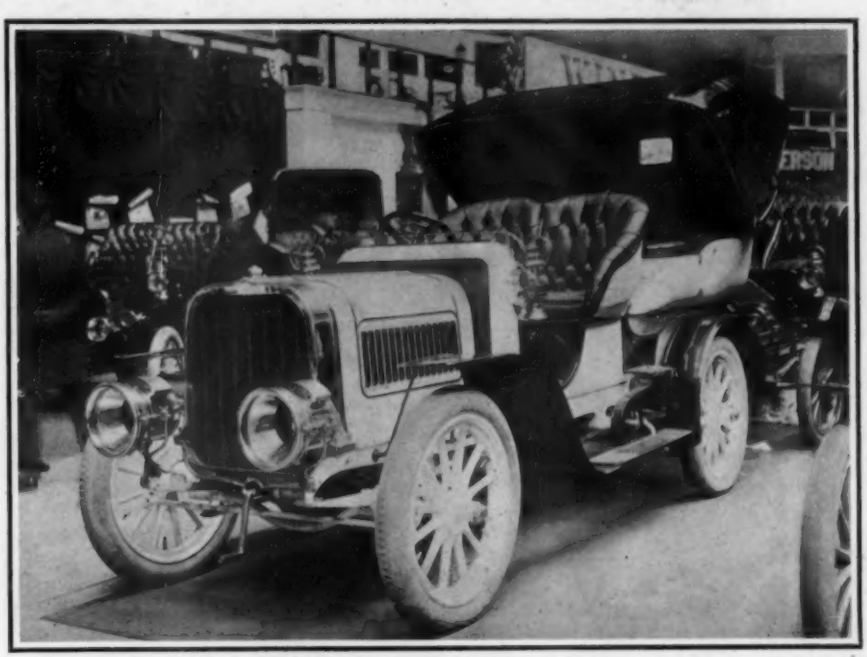
The Model C chassis is shown on a stand, with all working parts open for inspection, and one of the new motors is shown with sections of cylinder walls, valve chambers, etc., cut away to show the complete working.

The complete cars shown are a Model A 40-50 horsepower, phaeton body, with side-entrance through wide door from running-board; the body being finished in Winton red, with black moulding and stripes; a striking and handsome car. The Model B 24-30 horsepower, is shown with limousine body, finished in maroon and black, the interior upholstered in a light drab cloth. with satin tufted ceiling. The Model C 16-20 horsepower, has a side-entrance phaeton body in silver gray, with ox-blood red leather and stripe, a very handsome color combination. All of the cars are fitted with four-cylinder motors and all have large rear seats, accommodating three persons easily, with very comfortable individual front seats. The simple control system of the old cars is retained.

Autocar Company.—A new 16-20-horsepower car with a four-cylinder vertical motor, makes a radical departure from previous construction by this firm, which has always been a leading advocate of the two-cylinder horizontal opposed motor. Besides the difference in the motor, the new car embodies a number of new features, among which are wheel control, a brake and clutch interlocking device, by which the application of the emergency brake throws out the clutch, improved cardan joints, a removable top on the rear live axle construction, allowing easy access to the interior mechanism, roller bearings throughout, mechanical oiling and the location of the distributor on the dashboard.

The cylinders of the new model are twin-cast, there being no right or left to the pairs, so that they are interchangeable. The inlet and exhaust valves are also interchangeable. All the valve gears are encased. The motor bearings are bolted to the upper half of the crankcase, the lower half being removable without interfering with the bearings.

Lubrication is by splash and continuous force feed from a gear-driven oil pump. Motor and transmission are mounted on the same pressed steel cradle, and are protected by a shield. They are hung low on the same frame, keeping the center of gravity down and giving almost a straight line from the



POPE-TOLEDO 45 HORSEPOWER CAR WITH SIDE ENTRANCE AND VICTORIA TOP.

motor crank shaft back to the rear axles, thus reducing the work of the cardan joints. The control has been placed at the right-hand side, and the grips for spark- and throttle control are located on the rim of the steering wheel. The gear shift lever, giving control of the sliding gear speed changes—three forward and one reverse—is attached to the frame outside the car body. Another side lever controls the emergency brake, which as soon as thrown releases the clutch. The clutch is operated by a foot pedal carrying a hold-out pawl. When it is desired to leave the clutch in a disengaged position a slight side movement of the foot releases the pawl and the car may be left with the motor running and the shifting gears in a neutral position. This clutch hold-out is instantly released when it is desired to again start the car by simply pressing the foot on the clutch pedal.

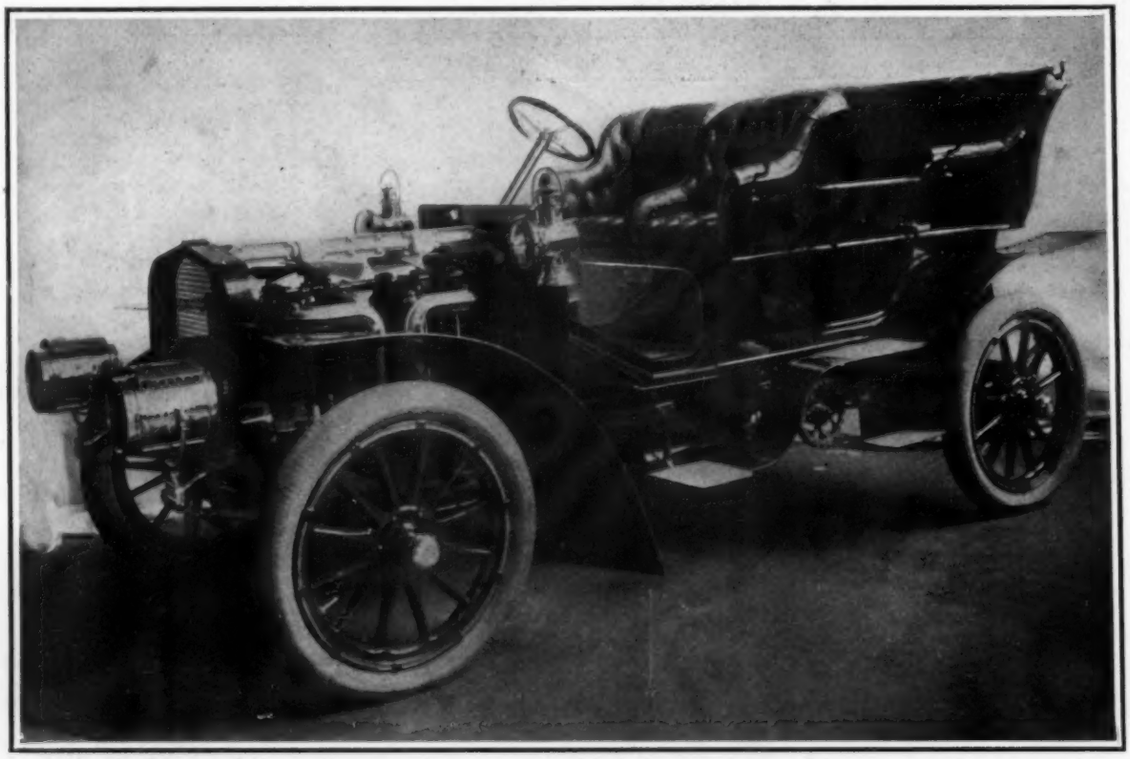
The vaporizer is new with a vertical auxiliary air valve. The cooling system is a cellular radiator with a fan and a centrifugal gear-driven circulating water pump. The ignition is by jump-spark with a timer on the dashboard, the current being supplied by a two-cell battery. The two-cylinder horizontal opposed motor, models of last year, improved in details, are shown in both a side-entrance tonneau touring car of 12 horsepower and a two-passenger car of 10 horsepower.

Cadillac Automobile Company.—Four complete cars are shown in the exhibit of these makers, three of which are entirely new. In addition to the engine and transmission of two of the models, with four cylinders and one cylinder respectively, which are opened so as to show the interior construction and operation. Interest centers in the new vertical motor four-cylinder touring car, the first of this type to be produced by the Cadillac Company. This car was designed with a view to all round service. It is not extremely high-powered for its weight and is in no sense a racer, 45 miles being its comfortable rate per hour. The appearance of the car is good and every detail has been carefully planned for the highest possible working durability. Ball bearings of ample dimensions are used everywhere, except for the crank shaft. All rubbing surfaces are enclosed in dust-proof casings, hardened parts are used wherever hardening is of advantage and the lubrication throughout is positive.

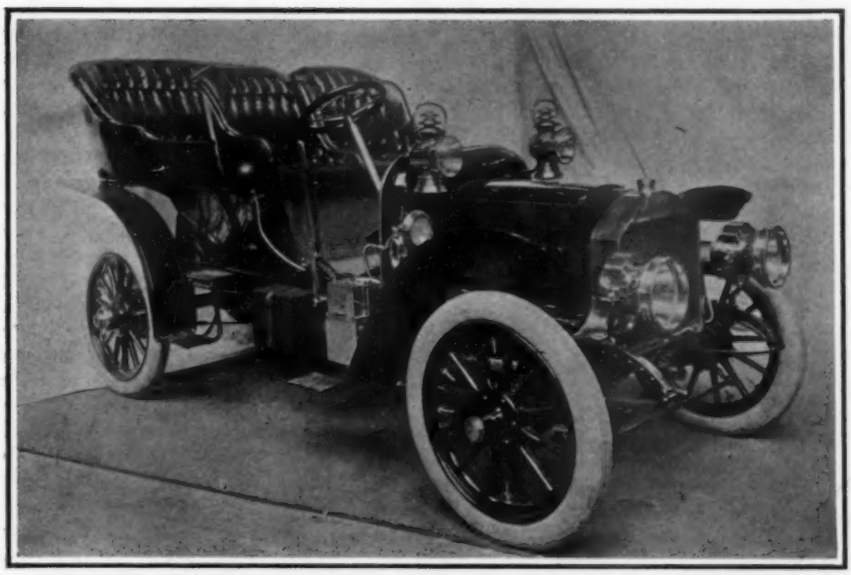
The motor is of the four-cylinder vertical type and of 30 horsepower, the cylinders being 4⅜-inch bore by 5-inch stroke, water cooled by a centrifugal pump. The copper water jackets are of the Cadillac type. Automatic splash lubrication is employed with a uniform feed to each cylinder irrespective of grade. The valves are mechanically operated with a variable inlet control, the exhaust and inlet valves being interchangeable. There is an automatic oil governor. The engine base is of aluminum. The connecting rods and crank shaft are of drop forged steel. The drive is bevel gear with extra large hardened steel gears, ball bearings throughout in an oil-tight aluminum gear case. There are hardened steel universal joints of special design. The transmission gear is planetary, three speeds forward and one reverse, with a direct drive on the high gear. All speeds are controlled by a single lever.

The carbureter is of special design with an automatic elastic stop diaphragm. Mechanical lubrication is employed with sight-glass feed and a quick adjustment from the seat is possible, as also is hand operation of the oil pumps. A double syphon muffling system is used. The radiator is cellular with a fan. The brakes are double acting, the foot brake acting on the drive shaft and the hand brake on the rear hub drum, the motor being released by an interlocking device when the brakes are set. The gasoline capacity comprises a twenty-gallon storage tank with exhaust pressure transferred through a five-gallon running tank fitted in the dash, sufficient for 200 miles. The weight is 2,600 pounds.

The other two new models are a side-door entrance tonneau touring car and a runabout, both of 10 horsepower, and together with the old model touring car with detachable rear entrance tonneau, possess the single cylinder water cooled motor of 10 horsepower. Other distinctive features of Cadillac construction found in all these cars are gas engine control by varying both the time and lift of the inlet valve, the use of a drawn sheet-copper water jacket secured by its integral bottom member clamped between the end of the cylinder and the valve-chamber. An original arrangement of oil-tight encased planetary speed change gear



NEW CORBIN 24-35 HORSEPOWER SIDE ENTRANCE OPEN CAR, BUILT BY THE CORBIN MOTOR VEHICLE CORPORATION OF NEW BRITAIN, CONN.—NOTE AIR COOLED MOTOR AND SUPERIMPOSED HORIZONAL FANS.



SMART NEW TYPE STUDEBAKER 20-22 HORSE-POWER SIDE ENTRANCE TOURING CAR.

elements, by which any desired number of forward speed-changes and one reverse speed can be had with a single driving pinion fixed to the driving shaft, the driven member consisting of a single internal gear, each added speed change adding but one single moving part to the aggregation. A new form of no-float carbureter, which works well at from 150 to 2,000 revolutions per minute of the motor crank shaft, and has the merit of indifference to angle of inclination, is used.

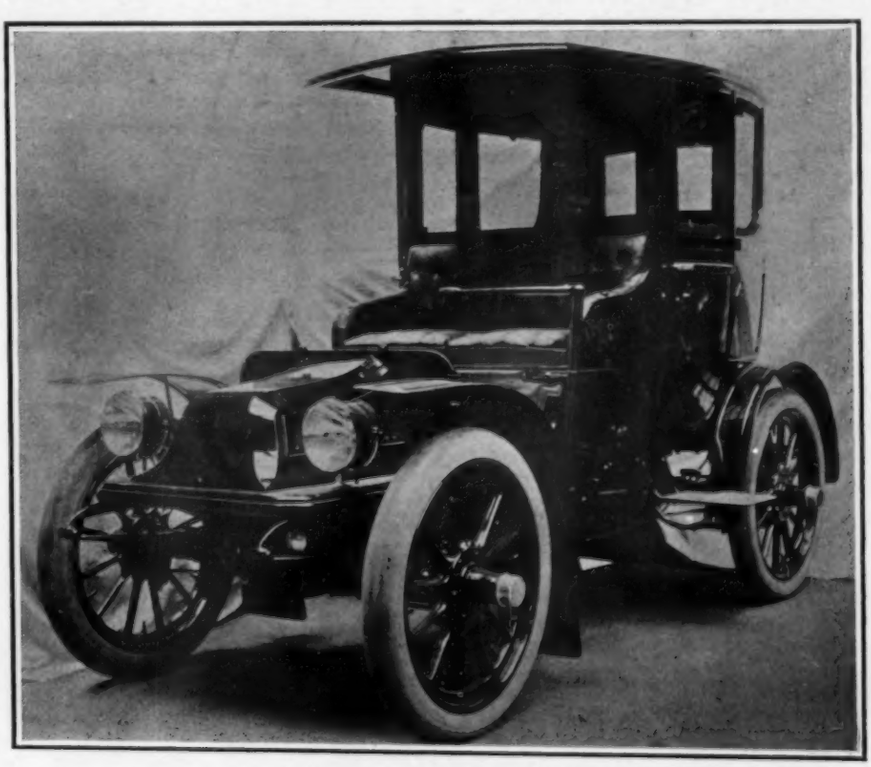
Daimler Manufacturing Company.—It is hardly necessary to say more of this exhibit than that the company has been to all appearances, very successful in its first effort to reproduce the Mercedes car of the parent German company. The chassis is shown and also the body separate. The car, as is generally known, is built directly from the working drawings of the Daimler Motoren Gelleschaft, of Unterturkheim, Germany, under whose patents the American company has always operated. Where the proper material was not forthcoming in this country, it was imported from Germany; specimens of the axle forgings and other parts in the rough, being shown. Every part is copied exactly from the latest Mercedes model, 40-45, the materials being exactly duplicated, as well as the form and finish. The chassis is shown over a mirror. The body is of the Cannstatt pattern; one notable feature is the width of the door, far in excess of most cars of the present time. The color is a rich lake, with no stripe.

Electric Vehicle Co.—Eleven vehicles, ranging from high-powered gasoline cars to small electric runabouts, are shown, but interest centers in the new 35-40-horsepower four-cylinder Columbia gasoline car, which takes the place this season of the 30-35-horsepower car of last year. This car is in most respects similar to its predecessor, but such changes in details as a season's use suggested have been tried out and incorporated, one of the most important of which is a new carbureter of the aspirating type, that automatically maintains a correct explosive mixture under all conditions of engine speed and throttle opening. There is also a new system of spark and throttle control, by means of two levers so mounted on a non-revolving head within the steering wheel that they stand at all times in fixed relation with the operator. All connections from these levers are ball joints of special design, insuring absence of back lash and delicacy of adjustment. This device replaces the spools used last year. The new pedals operating the clutch and foot brake are much larger than formerly, and the hand brake and speed-changing levers have a new method of ratcheting.

Another important feature is a pressed steel frame five inches deep, to prevent settling, and meeting in full the increased strain of the side door type of body. The footboard and dash are permanently attached to the frame. Bore and stroke of the engine are each five inches. The normal engine speed is 800 to 900 revolutions per minute, and it is possible to run the car on the high gear at any speed from eight to sixty miles per hour.

All valves are on the same side of the engine and all are mechanically operated. Lubrication of the cylinders, piston pins and crank shaft is by a positively driven mechanical oiler. The crank pins are splash lubricated. Ignition is by jump spark from two sets of storage batteries, either of which can be used at will. The cooling system includes a Whitlock cellular radiator and high-speed fan, and contains seven gallons of water, the consumption of which is practically negligible.

Transmission is by sliding gears, with four forward speeds and one reverse, with direct drive on the high gear. The drive is by hardened steel bevel gears to a countershaft and side chains to the rear wheels. The foot and hand brakes interlock with the clutch. The clutch is conical and leather-faced, with provision for reducing the driving effort of the engine practically to



FINELY FINI HED BAKER ELECTRIC MOTOR IN FRONT COUPE, WITH LEVER STEER.

zero before the clutch is released. The irreversible wheel steering is of the worm and gear sector type, with spring cushioned connections to prevent shocks.

The wheelbase is 108 inches for the side-entrance tonneau and 112 inches for the royal victoria, landaulet and limousine bodies.

The Columbia two-cylinder 18-horsepower side-entrance tonneau is shown with several additions and changes. The carbureter is the same as that used on the new Columbia cars of higher power. In place of the old method of speed changing by means of two levers, one lever is used for the three forward and reverse speeds. The cylinders are five inches in diameter, with 4 1-2-inch stroke. The cylinder lubrication is automatic through adjustable sight-feed. The engine is equipped with a ball governor acting directly upon the throttle valve in the carbureter, and this governor will run the car at approximately twelve miles an hour up hill and down. Ignition is by jump spark, the current being obtained from 25 dry cells, in five groups of five cells each. The cooling system includes a Whitlock cellular radiator, with fan and a gear-driven pump of large capacity. The system contains five gallons of water. The transmission gears run in an oil bath, and the drive on the high gear is direct. The clutch, which is of the external expanding, metal to metal type, with bronze shoes working inside the drum, is in the gear-box, but is separated from the gears by a vertical wall. Drive to the rear axle is by propeller shaft and hardened steel bevel gears of large size. There are powerful hand and foot brakes, both acting on drums on the rear hubs. The wheelbase is 81 1-2 inches. Capacity of gasoline tank is ten gallons. The side-entrance body is of a luxurious type, with ample accommodation for four people. The entrances are broad and the doors have full outward swing. The large forward bonnet and general lines of the car are very suggestive of four-cylinder construction. Three models of this car are shown—one with standard body, one with a cape top and another painted white with red trimmings.

A new electric vehicle is the Columbia electric victoria-phaeton, which duplicates the running gear, motive parts and controlling mechanism of the Columbia runabout, except that the phaeton has a chain case, larger tires, and, on account of its heavier body, a battery of twenty-four cells, the speed being equalized by a difference in chain reduction. The hood is of hand-buffed leather, and in connection with a rain-boot, affords complete protection in stormy weather. The phaeton is well adapted for physicians, and also peculiarly well suited to ladies' use. Of the Columbia electric town carriages of the coach class, two models are shown, a brougham and a landaulet. Both vehicles have inside accommodation for four persons. Interior furnishings include silk curtains, electric lights, driver's signal, speaking tube, card case and other conveniences.

Ford Motor Company.—Two new cars are shown by this company, one of which marks a radical departure from its well-known 10-horsepower runabout. This is a 20-horsepower touring car with a four-cylinder vertical motor with a side-entrance tonneau body which sells for $2,000. The motor comprises four vertical cylinders, each of 4¼-inch bore and 5-inch stroke, cast separately, copper jacketed for water and mounted upon an aluminum base. The main shaft is of the five-bearing type, all bearings being in the upper half of the crank case. The lower half is detachable, so that all bearings and all the connecting rods are readily accessible after the case is removed. Splash lubrication is employed, the lower portion of the case forming a reservoir for the oil. The valve push rods are adjustable in length.

A new and distinctive feature of this car is the transmission and globe driving joint. The universal globe joint is a very large globe of steel, its ample bearing surface giving great strength, and its well babbitted and oiled bearings insuring freedom from wear. The housing of this globe is firmly fastened to a portion of the main frame. In the interior of the globe is a rolling device having a square hole for the admission of the square end of the driving shaft of the speed controller. This square shaft end does not slide in any way. The rolling mechanism inside the ball connects directly with the main bevel gear driving shaft, which runs to the rear axle incased throughout its length in a rigid tube running from the universal globe to the differential gear housing on the rear axle. The entire mechanism of universal globe, drive shaft and bevel gears is automatically oiled by a tube from the main oil reservoir.

The rear springs of this car are not used in any sense as driving members. They are full elliptic in shape, and they are used simply as springs to ease the riders. Attached, one to each of the outer ends of the rear axle, are two strong rods running diagonally inward and upward to the point where the driving shaft of the speed controller engages with the driving bevel gear shaft. It is these two rods that transmit the driving power from the rear axle to the frame through the globe universal joint. The construction of this globe joint allows the rear axle and its driving rods to assume any position which the most uneven road may give it, and yet to transmit the driving power without causing the dangerous strains to springs or frame.

Another model now shown for the first time is a 14-horsepower car with a side-entrance tonneau, double opposed motor, the cylinders being 4½ by 4 inches. The wheel-base is 84 inches, the tread is 55½ inches. The capacity of the gasoline tank is nine gallons, of the oil reservoir three pints, and the cooling water capacity is four gallons. The weight is 1,400 pounds.

The original Ford runabout is also shown with a tonneau body. The Ford delivery car is not shown for lack of space, but may be seen outside the Garden at the garage of John Wanamaker, the local agent for the Ford.

H. H. Franklin Mfg. Co.—A new 20-horsepower car with a side-entrance tonneau which is also made in 30 horsepower, is the principal novelty in the exhibit of this company. There is also a new runabout of 12 horsepower, termed a "Gentleman's Roadster," and the Franklin trans-continental car in which L. L. Whitman made his trip from the Pacific to the Atlantic in less than 33 days. All these are made with four cylinders, air-cooled engines of the well-known type originated by this company.

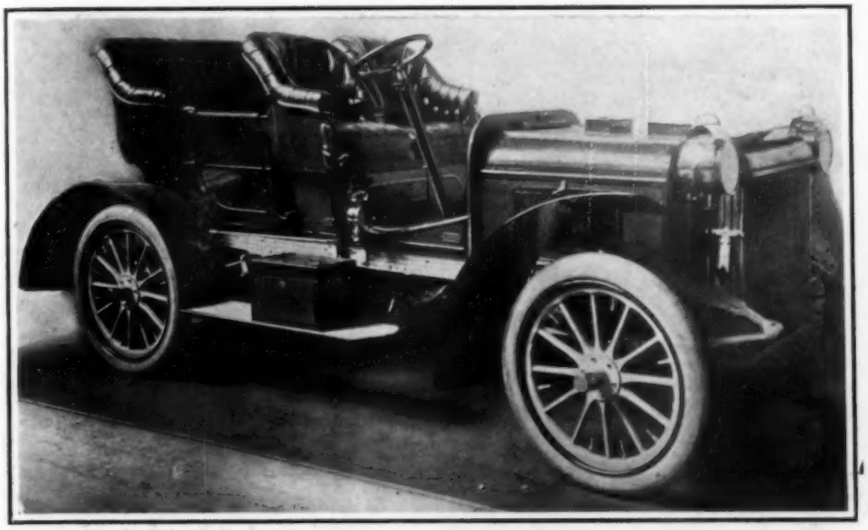
The motor of this year is noteworthy for the addition of a supplemental exhaust, which is claimed to add considerably to the efficiency of the engine. All valves are mechanically operated this year instead of inlet valves being operated by suction, as was the case last year. The valves are exact duplicates on both sides, and so are perfectly interchangeable. An aluminum crank base is another new feature. A sight feed oiler on the crank case shows exactly how much oil is contained in the case. The cylinders and pistons are ground to fit. The engine base has two removal plates to allow access to the cranks and piston rod bearings. The transmission has been made heavier and stronger, and all wearing surfaces have been increased in area. While the familiar oval Franklin grill is retained on the smaller models, a new circular grill with a barrel-shaped hood is shown upon the new model. The body of this car has double side entrances, which are unusually large.

The new 20-horsepower engine has bore and stroke 4 by 4 inches, a wheelbase of 100 inches, weighs 1,800 pounds, has the regular three-speed sliding gear transmission, and is capable of a speed of 40 miles per hour.

The 30-horsepower car is similar in almost every respect, except that of size. The engine cylinders are 5 by 5 inches, the wheelbase is 107 inches, the weight 2,400 pounds, and the speed 45 to 50 miles per hour.

Thomas B. Jeffery & Co.—The principal changes in this year's Rambler models are a pressed steel frame with the engine hung on a transverse pressed steel girder, instead of being placed directly on the frame, giving increased rigidity. The wheelbase has been lengthened and larger bodies provided all with double side-door entrances, the old style body not being made except on order. Increased propulsive power has been gained by the use of special bearings, and the water and gasoline capacity has been largely increased.

There is practically no change in the engine, which is of the two-cylinder, horizontal opposed type, with mechanically actuated valves, both sets being worked from one cam shaft. All bearings are of large surface and composed of what is known as "non-friction" material. The pistons each have



LANE SIDE ENTRANCE TOURING STEAMER WITH VERTICAL CONDENSER IN FRONT.

six rings, which is another Rambler feature. The transmission, which has been greatly improved, is of the planetary type, with two speeds forward and reverse, but without internal gears, allowing the car to be run at a low speed, with no more noise than when running direct. The engagements are effected through frictional leather-covered clutches, which are all adjustable and easily replaceable when worn. These clutch bands are not used when a car is running on the high speed. The entire gearing and transmitting mechanism then rotates on the crank shaft, with, and practically a part of, the fly-wheel.

The ignition is jump spark, with two sets of dry batteries, though only one is in use at a time. A two-point switch attached to the coil box allows either to be used at will. Both sets of batteries and the coils are located on the dashboards.

The time of the explosion of the mixture is controlled by an automatic governor rotating in relation with the crank shaft, and so constructed that the charge is ignited later when the engine is running slow than when fast. A new feature of the carbureter is a lever connected with supplementary air ports, and attached immediately beneath the throttle, for the purpose of admitting more air, and consequently reducing the consumption of gasoline or to meet unusual atmospheric conditions. The Rambler-thermosyphon system of circulation is retained in this model. Lubrication is provided direct for the cylinders by two large glass oil cups immediately over them, and the other parts are cared for in a similar manner, no power pump being used.

Two brakes are provided, one on the transmission and the other acting directly on the rear wheels, both being operated by a pedal on the footboard in front of the operator, and if necessary both may be operated together. The engine brake may be applied at high speed with the effects of immediately releasing the clutch. The differential, which is located on the rotating enclosed rear axle, is of the spur gear type, and is entirely enclosed, being practically oil and dust proof. The four full elliptical springs of previous models are retained this year.

The cars exhibited comprised a new surrey of 20 horsepower, with a side-entrance body and canopy top, and 18-horsepower car of similar pattern with side-door entrance tonneau, but without the top and a 20-horsepower car with limousine body, both the 20-horsepower cars being new this year.

Packard Motor Car Co.—The Standard Packard Model "N," which is shown in a polished chassis, a side-entrance tonneau touring car, and with a limousine body, is in most respects, the same as last year, but with a number of minor improvements. Chief of these is the increase of the power from 22 to 28 horsepower, a new carbureter, larger rear springs, the placing of the oilers in front of the dash, etc. The new feature of the vaporizer is that the mixing chamber is warmed by the water which circulates around the cylinders of the engine, thus replacing the heat which is absorbed by the vaporization of the gasoline, and preventing any liquid fuel from reaching the motor. The motor, which, of course, is of the four-cylinder vertical type, is very simple and compact. There is no packed joint between the head and the barrel, but both are cast in one piece, in pairs, making them strong and light. All parts which have any work to do are enclosed and run in an oil bath, but are easily accessible. The oiling system has a single plunger pump driven by two small gears, the pump working only when the engine is turning over. The clutch is on the expanding principle, and the more power that is applied, the stronger it grips, because of the fact that the fly-wheel rotates in the direction which tends to unwind the clutch band and therefore brings it into closer contact with the inside of the fly-wheel rim.

The transmission is on the rear axle, the gear box, usually suspended under the center of the car, being here combined with the bevel driving gear of the rear axle, into a single unit, so that the alignment of all the parts is permanently maintained. The drive is direct on the high gear, and the power developed by the motor is transmitted direct to the rear wheels, the same as though the crankshaft of the motor was long enough to meet the rear axle, there being nothing between them but the two bevel gears. All shafts transmitting power run on ball bearings.

The control is centered on the steering-wheel, a small lever on the left, varies the

LUXURIOUS CLOSED BODY ON 20-HORSEPOWER RAMBLER CHASSIS AT JEFFERY STAND.

time of the spark, while on the right is placed the throttle lever, which acts upon a centrifugal governor and so upon the throttle, by which a correct speed is obtained by one setting of the lever. There is also an accelerator pedal, which will speed the car up to 25 miles an hour, dropping back to the speed set by the throttle lever, automatically, when released.

There are four brakes, all on the rear driving wheels. The two internal expanding brakes, and the two external clamping brakes all work on the same drums, one pair inside, and one pair outside. The external brakes are worked by a foot-pedal, and the others by an outside hand lever. The gasoline tank has a capacity of 20 gallons, which under ordinary road conditions, is good for about 18 miles to the gallon. The tires are all of the same size, so that an extra tire will fit any wheel, and a place is provided for carrying it under the body of the car.

Peerless Motor Car Co.—This company suffered a heavy loss by the wrecking of its entire exhibit in transit to the show by a collision in the railroad yards at Buffalo early last Sunday morning. The exhibit, which comprised a polished chassis and two complete cars, was entirely demolished. It was impossible to replace the chassis at such short notice, but an order was telegraphed to Cleveland for duplicates of the cars, which arrived Tuesday evening. The front and rear axles and wheels of the chassis were brought on and shown in their damaged condition. Three complete cars were shown—a side-entrance tonneau, a landaulet and a limousine, all being mounted upon the new 1905 chassis, which includes a number of new features this year. Chief among these are an entirely different style of engine, radiator, axle and carbureter, and a system of magneto ignition instead of the coil previously used.

A new feature of the construction of the motor, which is shown in only one other car in the garden, that being the air-cooled Franklin, is an auxiliary exhaust on each cylinder. This is located at a point near the bottom of the piston stroke, and is intended to take away the main portion of the spent gases immediately after the explosion, keeping the cylinder head coooler and saving the exhaust valves from excessive heat, so they will not burn or require any more attention than the intake valves. Relieving the combustion chamber from the pressure of the spent gas also lightens the work of the piston in its scavenging stroke, all of these facts increasing the efficiency of the motor. The four vertical cylinders are cast in pairs and mounted upon an aluminum crank-case.

Both the intake and exhaust valves are located in the head of the cylinder, and are mechanically operated. The location of these valves in the cylinder head does away with off-set valve ports, and reduces the area of the combustion chamber, necessarily in contact with the incoming gases, so that the incoming charge is kept comparatively cool until ignited.

APPERSON BROTHERS' STAND. BEAUTIFULLY FINISHED 40-HORSEPOWER CHASSIS ON THE RIGHT.

The pistons are fitted with four eccentric rings, lubrication being effected through tubes running to the cylinders from the force-feed lubricator. The crank shaft has three bearings, and the construction of the case is such that the brackets supporting it are on the upper half of the case, so that by drawing a few bolts the lower half of the case may be open without removing the engine. The crank shaft bearings are oiled by tubes connected with the force sight feed lubricator, and also by a splash system.

A new feature is the rear axle, the drive from the differential to either rear wheel being accomplished by squared end shafts, which operate a clutch-plate on the outer end of each hub. These shafts do not come in contact with the axle tube, so that any strain the axle may sustain cannot cause the shafts or bearings to bind. This construction also allows the use of an arch-rear axle, instead of a straight one, and permits the rear wheels being pitched in the same plane with the front wheels. The wheels revolve on a stationary axle on adjustable ball bearings, so there is no load to carry on any moving part of the rear axle.

The transmission is of the sliding gear type, with four speeds forward and one reverse, controlled by a single lever, the motor being connected directly with the rear axle, with no gears in use on the high speed. The gears are enclosed in an aluminum case and run in oil. The radiator, of new design, consists of flanged copper tubes, set vertically between a header on top and a tank underneath, the circulation being maintained by a centrifugal pump, gear driven from the half-time shaft. The flywheel has a self-contained cone clutch, which is engaged by means of an internal spiral spring of large diameter, and is released by a foot lever or by the application of either brake. The governor, which automatically regulates the speed of the engine, is located within the gear of the half-time shaft, the arms of the gear being so curved as to allow the governor weights to lie within them. The ignition is by a magneto, gear driven from the half-time shaft, and wired for a jump spark, though a coil and batteries will be supplied, if desired.

The transmission from the speed gear to the rear axle is by means of the telescopic flexible shaft, with universal joints consisting of yokes and crosses of hardened drop forgings. This is the same construction which was used last year. Steering is of the irreversible wheel type. The control of the motor is by means of a throttle and governor, the throttle and spark advance levers being located on the steering wheel. Both the clutch and the foot brake pedals push forward. The braking system is applied to the rear wheels only. The foot brake operates a clutch band on both rear wheels, and the emergency brake is applied by a hand lever located on the right side, which applies an additional brake to both rear wheels by means of an external expanding clutch. The lubrication is by the force feed system, an oil reservoir being mounted under the toe-board immediately back of the dash. From this reservoir the oil is forced to each cylinder, each crank shaft bearing and to the front and rear reservoirs of the crank-case by separate positively driven pumps located within the reservoir. The rear axle is packed in cup grease, as are the universal joints of the flexible shaft, and all bearings in the wheels. The gasoline tank, which is located under the driver's seat, has a capacity of 18 gallons.

This car is built in 24, 35 or 60 horsepower, and is fitted with a number of different style bodies.

Complete Cars In the Restaurant.

AS was indicated in the last issue, the restaurant, which formerly has been the especial gathering place of the foreign cars, numbers this year in that category only the exhibit of Panhard and Levassor, the Palais de l'Automobile, and De Dietrich & Co. They occupy the central space and are surrounded on all sides by machines of more indigenous growth.

C. H. Blomstrom Motor Co.—Two models of horizontal opposed cylinder runabout and touring car are shown at this stand, under the name of "The Queen." These cars have planetary transmission gear, wheel steering, angle steel frame, and rear or side entrance tonneau in the four-passenger models.

H. H. Buffum Company.—The cars shown are, as usual, fine examples of mechanical design and finished workmanship. Two sizes are shown, of which the smaller, a two-passenger "tourabout," with a four-cylinder engine, has individual copper water jackets and mechanically opened inlet valves. The bore and stroke are each four inches, and the engine derives a peculiar appearance from the top of the aluminum crank case being widened into a sort of table whose front and rear edges are bolted to cross members of the frame, with whose top surface this table is flush. A regular conical fly-wheel clutch is used, and the gear box behind it gives two forward speeds and one reverse by sliding gears, the high speed being a direct drive, in which no idle gears are running. The clutch is a little unusual in appearance by reason of the cone being enclosed by a spider attached to the flywheel, so that the clutch spring acts between the hub of this spider and the hub of the clutch cone.

The pedal control system is used, and the car is throughout equipped in the approved manner of a modern touring car with float feed carbureter, forced circulation, two sets of brakes, wheel steering gear, and the like. The place of the radiator is taken by a substantial tank pierced by only a few large holes fore and aft, this being a recrudescence of a construction rather commoner three years ago, and the rear hub brakes seem rather small until one remembers that this sporty-looking turnout is intended for only two people.

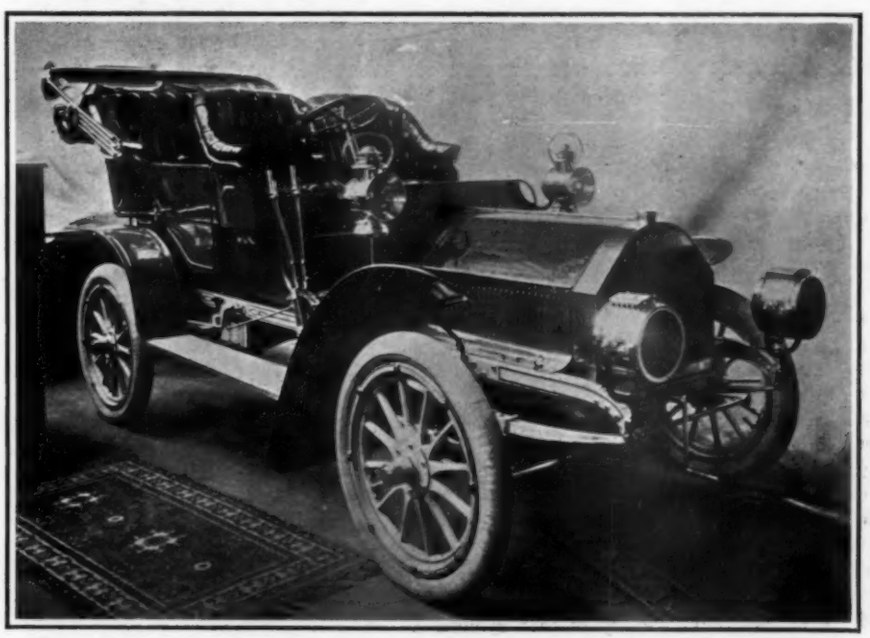
The touring car has cylinders 4½ by 5½ inches, cast separately with integral heads and jackets. The inlet valves, instead of being located in the head and opened by rockers, as in the small machine, are symmetrical to the exhaust valves and operated by their own cam shaft. The carbureter is automatic, both the throttle and the auxiliary air inlet being controlled, not by a centrifugal governor, but by water pressure applied to them by a pressure diaphragm connected with the circulating pump. In addition to this automatic throttle, there is a separate throttle valve controlled by hand, so that the function of the former is only to prevent racing when the clutch is released. The clutch is similar in character to that of the lighter car. It drives through a flexible coupling to the first gear shaft of a three-speed sliding gear transmission, which runs in ball bearings and gives a direct drive to the cross differential shaft on the high speed. These ball bearings, by the way, are of the same make, the D. W. & M., as those invariably used in the foreign cars.

The differential shaft runs in large sleeves clamped in sockets in the gear case, and having their outer ends carried by brackets attached to the side members of the frame. The front end of the gear box has a ball and socket support under a cross frame member, thus giving a perfect three-point suspension. As the differential is thus altogether encased, separate brakes are applied to the sprocket pinions themselves. These are metal rings expanding in drums integral with the pinions. The rear hub brakes are likewise metal to metal and enclosed. The radius rods follow up-to-date practice in swiveling on the rear axle and supporting the brakes, which thus impose no strain on the springs when applied. The engine is lubricated by an ingenious mechanical device which feeds oil to points within the crankcase where the connecting rods will catch it. Ignition is by Holtzer-Cabot low-tension magneto with make-and-break spark, and also by independent battery and spark coil.

Buick Motor Co.—A complete car is shown in the restaurant in addition to the chassis in the basement, in the report of which it will be discussed.

De Dietrich.—The De Dietrich models are substantially similar to the De Dietrich exhibition chassis at the St. Louis Fair, and the attendant with whom the writer spoke, explained that the latter was a sample machine of the 1905 model. A De Dietrich feature is the arrangement of the clutch, which differs considerably from the ordinary. The engine shaft is extended through the flywheel hub, and on it is a loose sleeve carrying two strong arms, into which are secured two rearwardly projecting pins. This sleeve, etc., has no fore-and-aft movement on the shaft, but is connected exactly like the usual clutch cone to a cardan shaft, driving the first gear shaft in the transmission. On this sleeve is mounted the hub of the clutch cone proper, which has a fore-and-aft motion only, and is guided by the two pins above mentioned. It is forced into the flywheel rim by a ball thrust collar actuated by a forged yoke connected to a lever, and the clutch spring is mounted on the transverse frame member to which the pedal shafts are attached, and acts on the upper end of this lever. The forged yoke mentioned, is connected to the ball thrust collar, in such a way that when the spring pressure is relieved it may be swung freely up, when the clutch cone may be drawn back far enough to renew the leather without dismounting anything; or, by disconnecting one of the cardan joints of the clutch shaft, the cone may be lifted entirely out. For this very convenient and accessible arrangement the penalty is, of course, paid in a constant end thrust when the clutch is in engagement.

The De Dietrich gives four speeds with indirect drive, and transverse differential shaft on the familiar Panhard system. No ball bearings are used. Oil is fed by a Dubrulle oil pump to a branched pipe feed-



STEVENS-DURYEA NEW VERTICAL CYLINDER MOTOR IN FRONT 20-HORSEPOWER CAR.

ing all four cylinders, and another pipe carries oil to the governor mechanism. The gear shaft bearings are supplied with grease from a screw pressure cup from which three separate grease pipes lead, each with its own pet cock to determine the feed. An especially attractive feature, remembered in connection with the chassis at St. Louis and now repeated, is the pressed steel radius rod, which swivels on the rear axle and supports the emergency brakes. It is perforated, and is as light as it is stiff.

The bodies on the De Dietrich cars include two side-entrance limousines, one of which has a folding card table and a folding vis-a-vis seat; one side-entrance tonneau with victoria top, and an omnibus, said to be a duplicate of that used by the Regina Hotel of Nice, for its depot service. This omnibus has inside electric lights and is handsomely upholstered. In addition to the service vehicles, there is a huge and uncanny looking racing car, said to be a duplicate of that driven by Gabriel in the Vanderbilt Cup race, and now for sale. It has a pressed steel frame of extraordinary lightness, strengthened with wood and trussed. The general features of that transmission, so far as one could see, were like those of the regular De Dietrich cars, but the steering knuckles were much like the new type used in the Richard Brazier.

Maxwell-Briscoe Motor Company.—Some decidedly interesting features are found in the Maxwell car. The engine is two-cylinder opposed, and lies across the front under a bonnet. Two sizes of car are shown, rated respectively at 8- and 16-horsepower, with motors of 4 by 4 inch, and 5 by 5 inch cylinder sizes, respectively. The larger car, which was the one more carefully examined on the first day of the Show has sliding gear speed change, giving three forward speeds, with direct drive on the high, and plain bearings throughout. The engine crankcase and the gear box form one continuous aluminum casting, with no partition between them. This long casting, from which the cylinders branch out like the top bar of a tree, slopes downward from front to rear in approximately the line of the propeller shaft, so as to minimize the angularity of the universal joints of the latter. The oil is naturally fed to each cylinder separately, and to the clutch also described, from which the surplus works down into the gear box. The oil is fed through sight feeds from a small tank on the front of the dash.

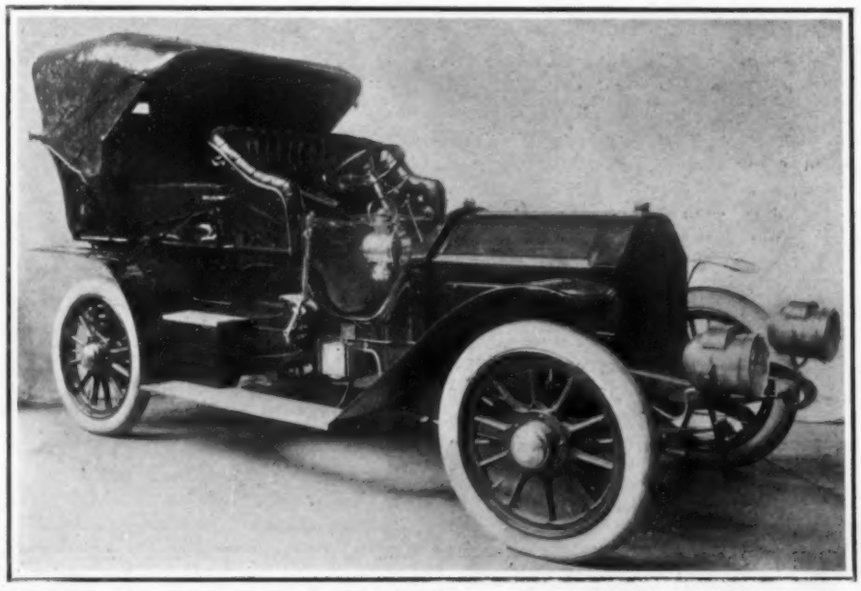
The clutch of this car is of the multiple disk type, now coming into prominence. All the disks are spring steel and are less than 1-16 inch thick. Without counting, there seemed to be about half a dozen driving disks and the same number of driven disks. The former are larger in diameter and have deep notches in their periphery, by which they engage two parallel fingers on the ends of radial arms at the rear end of the crankshaft. The driven disks have a smaller internal diameter, and are notched to be strung over flutes on the front end of the first gear shaft. The larger disks are cut at intervals on their edges, so that approximately tangent fingers are formed, which are bent a little to press against the adjacent driving disks. Thus, these spring fingers tend to separate the driving disks sufficiently to insure looseness of the enclosed driven disks. The disks are normally forced together by a 600-pound compression spring, whose thrust is taken up by a plain collar bearing on the crankshaft. A cam on a rock shaft operated by a side lever, acts on a yoke which compresses this spring away from the clutch disks, thus freeing the latter. A locking quadrant is provided on the gear box, so that the clutch must be released before the gears can be shifted. A small pedal in the footboard is arranged to release the clutch when the operator desires to keep both hands on the steering wheel.

Among the details of the motor construction, may be noted the form of the connecting rods, which are of cast-steel, in the form of deep U-shaped channels, which catch oil splashed about in the crank case and convey it to the wrist pins. The valve chambers are offset so that only two cams are necessary to open the four valves, and the cam shaft is carried in a square frame bolted on top of the crankcase proper, so that it may readily be removed. The power plant, formed by the motor and change gears, is supported at the front end by brackets securing the cylinder heads to the side frame members, and at the rear by a dropped cross member under the gear box; thus, there is no chance for distortion or straining. Steering is by bevel pinion and gear, and, of course, is not irreversible. Cooling is by gravity or thermosiphon circulation. From the top of each cylinder a short pipe goes to the radiator about midway of its height, and from the bottom of the radiator separate pipes go to the bottoms of the water jackets. One pipe near the top of the jackets connects the latter, doubtless, by way of precaution, in case of something getting stopped up. The Whitlock radiator is used, with a cooling fan.

The runabout of the same make has the planetary transmission contained as in the larger car, in one case with the engine crankcase, so that it runs in oil.

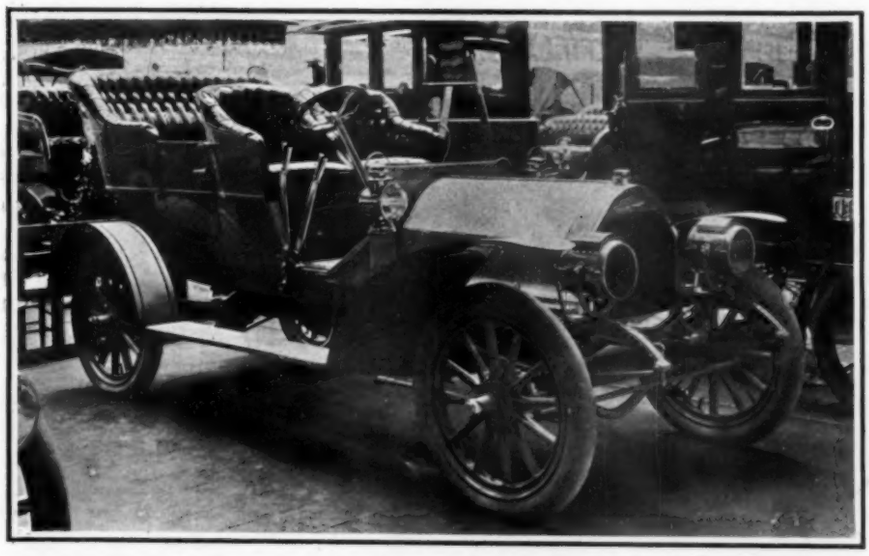
Palais de l'Automobile.—This concern's exhibit comprises a number of Panhards and two Renaults, all seemingly of last year's model. Some of the Panhards have brass water jackets and some have not. The bodies are nearly all side-entrance limousines, of handsome design, though one side-entrance tonneau with victoria top is among them.

Panhard & Levassor.—At the Panhard stand a very handsome 35-horsepower chassis was shown, which was said by the exhibitors to be a 1905 model. It seems



STEARNS' NEW MODEL VERTICAL MOTOR IN FRONT 40 HORSEPOWER SIDE ENTRANE CAR

that the honeycomb radiator and the hydraulic governor which have been mentioned as new Panhard features, are really fitted only to the new and special 50-horsepower car, which attracteed so much notice abroad, and that the cars of lower power are in no wise changed from last year. At all events, a number of familiar Panhard features were seen on this machine. The frame is of armored wood, and the cylinders are cast separately with integral water jackets and opposite valves. The gear box is the same affair of prodigious dimensions, but really light construction, and it is supported at the rear by the differential shaft itself, and at the front by a single support on a cross member of the frame. The clutch shaft and first gear shaft are rigidly connected, and the thrust releasing the clutch is applied at the rear end of the gear shaft, which moves bodily fore and aft. Both brakes release the clutch, and the differential brake is



HANDSOME SIDE ENTRANCE 24 HORSEPOWER STANDARD CAR WITH OPEN BASE MOTOR.

noticeably large and heavy, and is not cooled by water drip.

The Krebs carbureter is used, and the water circulation pump is driven by a friction wheel on the flywheel rim. Ignition is by the Eisemann high-tension magneto, and this magneto is mounted in a box on the back of the dash at the left hand, where it may be exposed by opening the top or front of the box. It is driven by a light sprocket chain from the exhaust cam shaft. The motor is carried on an angle-iron false frame, and all the springs are direct, under the side members of the main frame.

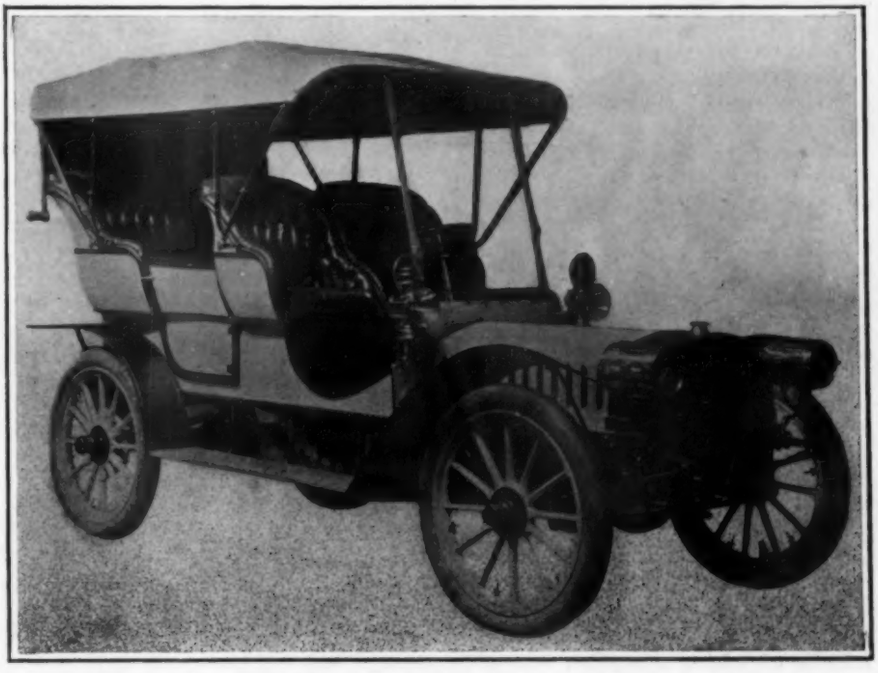
Plain bearings are used throughout the transmission, and a big branched pipe feeds grease from a screw compression cup on the dashboard to all the gear box bearings, and to the bearing of the pump friction wheel. All of these features, except, possibly, the location of the magneto, are identical with those of the 1904 cars.

The bodies on these cars comprise a very handsome line of side-entrance models, mostly of the limousine type.

Premier Motor Mfg. Co.—This is one of the strictly American cars, that is likely first to catch the eye. It has a four-cylinder motor, placed transversely in an open front bonnet, after the manner familiar in air-cooled cars, but the motor is a little larger than previous examples of this class, having cylinders of 3¾ inches bore, by 4¼-inch stroke, rated at 16 horsepower. There is nothing unusual about the cast flanges on the cylinders, but it is evident that the low compression—stated to be only 40 pounds—is mainly depended on to avert overheating. The valves open directly downward into the cylinder heads, are all mechanically operated through rock shafts and tappets, and are interchangeable. The exhaust pipes are carried out in front to equalize the cooling as much as possible. The crankcase, which is cast-iron, is provided with three transverse partitions to insure each crank getting its share of oil, and there are two standpipes rising from it which serve the double purpose of equalizing the pressure and enabling oil to be poured in. The crankshaft has separate bearings between all the cylinders, and the case is cast with oil pockets over all the bearings.

The transmission is by 1-inch pitch roller chain from the motor to a Ball planetary gear, located transversely under the seat, where it is supported by a cast-iron pan open at the top, which protects it somewhat from dust. From the other, end of this planetary gear another chain transmits to the rear axle, thus giving a double chain reduction, and avoiding the necessity of using a very small, sprocket pinion on the motor. The planetary gear is of liberal size, and has no internal gears. The rear chain is tightened in the usual way by radius rods, and the motor chain is tightened by shifting the motor bodily forward on two transverse frame members, on which the crankcase feet rest. These feet are elongated and slotted, and a long set screw at each end of the motor facilitates the adjusting process. The rear axle shafts run in a tubular casing in four sets of roller bearings. The Brown-Lipe differential is used, and is supplied with two 9-inch brake drums, on which bands are simultaneously tightened by pedal. Full elliptical springs are used at front and rear. The bodies seat two or four passengers, and the tonneaus have rear or side-entrane, as preferred, the wheel-base for the latter model being 96 inches.

Reo Motor Car Co.—The new Reo car drew its share of attention, and proved to be an attractive car with double cylinder opposed motor and planetary transmission. To the mechanic it is especially interesting on account of the ingenuity with which the cost of construction has been cut down without sacrificing quality, so that an unusually capable car can be offered for the price. It has the regular semi-elliptic front springs, and full elliptic springs in the rear, and the frame is of pressed steel. A great simplification has been achieved, however, by carrying the motor, the planetary transmission, and all attachments such as carbureter and piping, and the actuating mechanism of the planetary gear, on a small separate frame formed by connecting two side angle members with deep web and narrow outwardly bent flange by two U-shaped channel members riveted to them. The channel members of the main frame are filled with wood in their middle portions,



NEW AUSTIN, MOTOR IN FRONT, 35 HORSEPOWER SIDE ENTRANCE TOURING CAR.

and this separate frame is simply slipped down till its flanges rest on the main frame members, when it is bolted through against the wood with two bolts on each side. A side lever operates the clutch and slow forward speed, and the reverse and service brake are applied by pedals. The transmission is of good size and has no internal gears.

The motor itself has cylinders 4¾ inches bore by 6-inch stroke, with mechanically operated inlet valves, and starting cams put into action by pressure on a small supplementary pedal, which is likewise arranged to retard the spark if that happens to be advanced. The right and left sides of the crankcase are closed by semicircular plates in such a manner that by removing them—and the bearing caps cast with them—the crankshaft, with the flywheel and transmission gear on it, may be taken out without disturbing the rest of the engine. The right-hand or outboard end of the shaft is carried in a ball bearing supported by a bracket bolted to the side angle member forming part of the subsidiary frame; and the motor itself is hung by studs from the U channel members. Lubrication is by sight feed oil cups to the pistons, and by splash to the crankpins. Splasher plates slotted for the passage of connecting rods prevent an excess of oil from coming into the cylinders. Each cylinder is provided with a separate carbureter, these being of the float feed type and having an ingenious double throttle valve so arranged as to throttle the air below the spray nozzle and throttle the completel mixture at the same time, thus increasing the suction at slow speeds. A neat detail is the use on the upper ends of the cork floats of loose needle pointed heads, which find their own bearing in the valve seats, despite any vibration of the cork floats. The carbureters are bolted direct to the cylinder heads.

Under the bonnet are carried the water and gasoline tanks and the battery box, which contains two sets of dry batteries. National spark coils are used with the Yankee double pole switch. The lever of this switch is removable and the coil box is provided under its cover with a thumb nut, under which the switch lever may be clamped for security and concealment when it is removed.

Emergency brake bands act on the rear wheels. They appear to be so proportioned as to act somewhat more powerfully ahead than when going backward. The rear axle has Hyatt roller bearings, and is not steadied against the torsional effect of braking. The running board is of perforated pressed steel, which suggests the query why this material would not do admirably for that purpose in every machine.

Walter Automobile Co.—The builders of the Walter car exhibit a very fine looking machine, which, however, was so covered that little of its interior could be learned at the time. From the catalogue it appears that it is constructed substantially on French lines, which this car has always followed, having a four-cylinder motor, conventional clutch, sliding gear transmission giving three speeds ahead and direct drive on the high gear, and propeller shaft transmission to the live rear axle. One notices that the ball bearings used in the transmission and wheels are of the same imported make as those in the Buffum. The rear axle of this car deserves notice because the wheels are not keyed to the driving shafts, but run on ball bearings on the axle tubes, and are connected by claw plates at the ends of the hubs to the driving shafts.

Wayne Automobile Company.—Here are shown two models, one rated at 16 horsepower, with a two-cylinder opposed engine of 5-inch bore by 5-inch stroke. This car has a planetary transmission and is quite conventional in its design. The other has a four-cylinder, vertical motor with separate cylinders, 4 by 5 inches, for which the makers claim 24 to 28 horsepower. It has mechanical inlet valves and a three-speed sliding gear transmission with direct drive on the high speed, and the usual cardan propeller shaft and shaft gears. Adjustable ball bearings of American make are used in both gear box and rear axle, and the gears are oiled by heavy cylinder oil which is poured into the gear box till it reaches the bottom of the shafts. A conical flywheel clutch is used, which is released by the application of either brake. The engine has jump spark ignition, and is lubricated on the splash system, with a single feed to the crankcase. Pockets are cast over the crankshaft bearings. The large ends of the connecting rods have the usual top oil holes, and in addition the connecting rod caps have had slots in them to admit the oil directly as they dip into it. The body of the larger car is a rather handsome side-entrance design, with a long wood running board finished in the natural wood.

Worthington Automobile Company.—Two Bollée cars are shown by this concern. One of them has a finished limousine body, the other a limousine body by A. T. Demarest & Co., of New York, which is not trimmed or painted, so that the visitor has a good chance to see what modern closed car body construction is like. The chassis of these cars were not exposed, but presumably are similar to that at the Importers' Salon.

In the Exhibition Hall, i. e., Cellar.

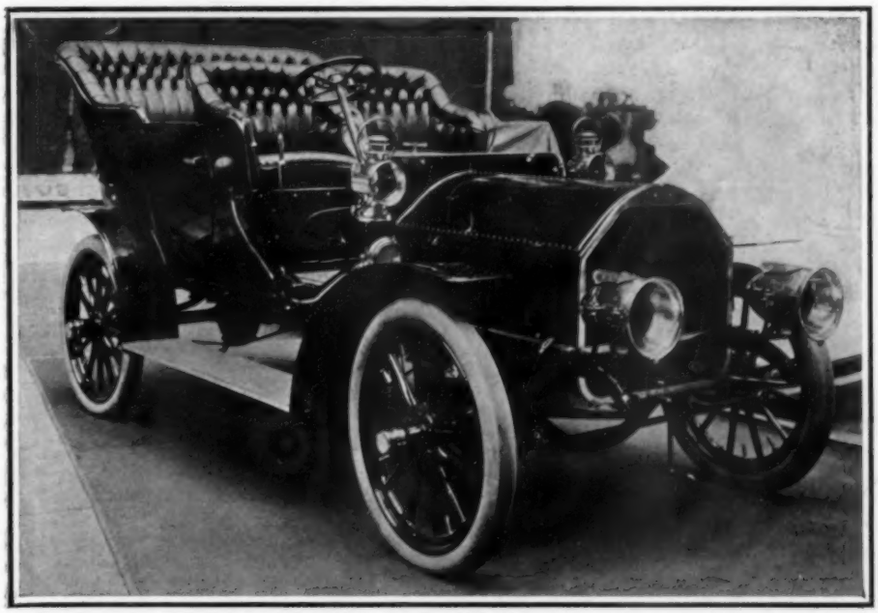
EXHIBITORS who were consigned to the basement of the Garden, dignified by the appellation "Exhibition Hall," were at considerable disadvantage. It is impossible to make the place look like anything but what it is, and the dim lighting and general lay-out at once give the visitor the feeling of being in a cellar. Many of the exhibits, however, would grace the finest space in the building, and the fact that they overflowed into the lower regions is no criterion of quality. The rule against flashlight photography, unlike the aggressive order against smoking, was rigidly enforced, and as a consequence photographs of basement exhibits could not be made without infraction. Gasoline cars occupied practically all the space, among them being the premier English car, exhibited for the first time at the New York show. The exhibits in place included the following:

American Electrical Novelty and Mfg. Company.—The "Ever Ready" dry cells for automobiles, clocks, electric flashlights and other electrical devices are shown.

Acme Motor Car Company.—A four-cylinder touring car of 30 horsepower, with a side entrance tonneau body, is the principal novelty shown by this firm. The four cylinders of the motor are cast separately and each is 4-inch bore and 5-inch stroke. The water jackets and cylinder heads are cast integral with the cylinders. The transmission is sliding gear, with direct drive on the high speed. The clutch is conical, leather to cast iron, self-centering and self-contained. The carbureter is of the float feed type, with automatic compensating and automatic governing. The ignition is by a jump spark, with a coil and high-tension magneto, governed by a hand lever. There are two hand brakes on the jack shaft and two compensating band brakes on the rear wheels. Steering is by a wheel, irreversible, with a quadruple screw and nut. There are four speeds forward and reverse, controlled by one lever. The lubrication is by sight force feed, except for the engine and transmission, where the splash system is employed. The wheelbase is 102½ inches, and the tread 56 inches.

The two-cylinder car is similar to the larger one as a whole, and is substantially the model of last year, with improvements. The two cylinders develop 16 horsepower and are similar in construction to those of the larger car There are but three speeds forward and reverse instead of four The wheelbase is 84 inches and the tread 54 inches. This was shown with a very handsome opera bus body. A two-cylinder runabout was also exhibited.

Ardsley Motor Car Co.—The Ardsley 30-35-horsepower touring car, which was shown with the chassis and with a side entrance tonneau body, is one of the few "assembled" cars in the show, being composed mainly of stock parts, many of which,



THE NEW ORIENT TOURING CAR WITH 20-HORSEPOWER AIR COOLED MOTOR.

however, were of special design and made to order. The car embodies a number of novel ideas in construction, one of which is a strongly trussed tubular casing on the rear axle which relieves the live shaft from all the weight of the car. Another novelty is that all bolt holes in connecting members are countersunk and fitted with washers which take up all shearing strains, so that the bolts are in tension only. The spark and throttle levers, which are placed upon the top of the steering wheel, do not turn with the wheel, but remain stationary, and both levers are in the center of their sectors when the motor is running at a moderate speed.

The motor is of the four-cylinder vertical type, and in general the accepted foreign principles of construction are followed. The car was described in detail in THE AUTOMOBILE of January 7, 1905.

Austin Automobile Company.—The Austin car represents another change from the horizontal opposed cylinders to the four-cylinder vertical, the 1905 car being an enlargement of the first four-cylinder turned out in the course of last year. The 50-horsepower chassis has a wheelbase of 108 inches, with steel-angle frame. The change-speed gear is of the planetary type, with central shaft and bevel-gear drive. The body is a handsome *Roi des Belges* phaeton with wide side door approached from running-board, with individual seats in front. It is finished in white with chocolate moldings and gold stripe, chassis and wheels to match; a Cape hood is fitted.

Black Diamond Automobile Company.—The 15-horsepower Buckmobile runabout, first seen last year in its new form with bonnet in front and wheel steer, is shown in chassis only. The new open body business wagon of the same horsepower has the radiator in front, with wheel steer, on the same form of chassis with long connecting springs. The carrying capacity is one ton and the body is of good length.

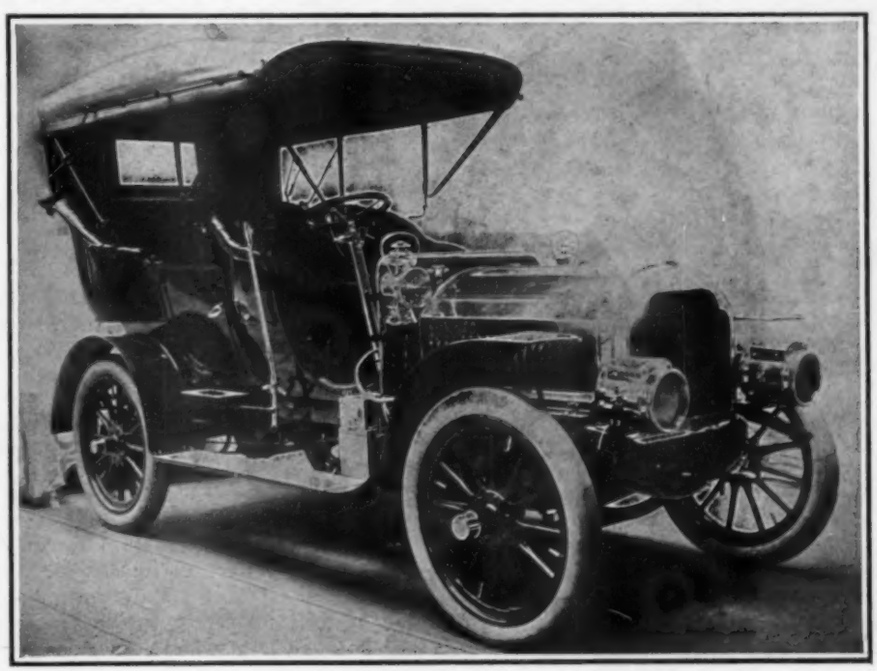
James Brown Machine Company.—The "sturdy" Cameron car, which made its first appearance a year ago as a single air-cooled cylinder runabout, is shown this year in two entirely new models, one a 12-15-horsepower touring car with a three-cylinder engine and a side entrance tonneau, and the other the improved runabout of 8-10-horsepower, with a two-cylinder motor. In both models the cylinders are placed vertically in front directly over the front axle. The valves are placed horizontally over the cylinders, so that the cold gas coming in through the intake valve is driven over the exhaust valve, cooling it. The cylinder ribs are in the line of air draft from a fan in front. The spark plug is placed on top between the valves, and is in the coolest part of the combustion chamber. The engine base and transmission case are all in one casting, with all bearings in line.

The transmission is of the sliding gear type, with direct drive on the high speed. The clutch is of the internal friction cone type. The carbureter is a float feed, with positive air regulation, the air control being by a small lever under the steering wheel. The gear, spark and throttle levers are operated from the steering post and all lock automatically. Engine cylinders and bearings are oiled by the splash system, the oil being supplied from a reservoir under the hood by an automatic filling pump placed on the dash. The gasoline tank is placed under the seat and carries a supply for a run of 150 miles.

Buick Motor Company.—The construction of the Buick car is well shown by a chassis, finished in white, with all parts exposed to view; the motor gives 22-horsepower on the brake with two opposed cylinders, 4½ by 5 inches, the heads and valves being well water-cooled. The planetary transmission and bevel-gear drive are shown.

Coldwell Lawn Mower Company.—This exhibit includes a new pattern of the Coldwell lawn mower, previously exhibited; now built in two sizes, the 35-inch cut and the 40-inch, driven by gasoline, and the 40-inch, by steam.

Crest Manufacturing Company.—The 1905 model Crestmobile touring car is similar to that of a year ago, except for the addition of a tonneau body with a canopy top and some other minor improvements. The



PIERCE GREAT ARROW SIDE ENTRANCE 28-HORSEPOWER TOURING CAR WITH CANOPY TOP.

vertical air-cooled motor and the other essential features of former practice are retained this year.

Detroit Automobile Manufacturing Company.—The smallest, and most inexpensive automobile in the show is exhibited by this firm. It is called "La Petite," and is a little two-cylinder 3-horsepower runabout, priced at $375. The air-cooled engine which is placed under a hood in front has two cylinders each 2 by 3 inches, developing 3¼ horsepower, which is said to be ample for grades up to 20 per cent, and allowing a speed of from four to eighteen miles per hour. The transmission is inclosed, dust-proof and self-oiling, the differential is of the spur gear type oil and dust proof, and the ignition is of the jump spark system controlled by a lever on the steering post. There are two brakes, one in the transmission and the other on the rear wheel axle inside of the equalizing gear case. A supply of gasoline sufficient for a run of 100 miles is carried. All speeds are operated by one lever, which controls engine, transmission and gasoline. There are two speeds, forward and reverse. The body is supported by an angle iron frame with special springs. The wheelbase is 51 inches and the tread may be either 40 or 56 inches. Two passengers may be carried in the single seat body.

Detroit Motor Car Supply Company.—Folding and standing canopy tops, and shields, dashboard clocks, and non-skidding tire protectors were shown by this firm.

John L. Dolson & Sons.—The Dolson touring car represents another rapid growth from a smaller car, the new side-entrance body being mounted on a chassis with 90-inch wheelbase. The car was described and illustrated in THE AUTOMOBILE of Jan. 7, so no detailed description is required; the body is finished in silver gray, gold and green stripe, with coach red chassis and wheels.

Eisenhuth Horseless Vehicle Company.—The unique vertical three-cylinder compound gasoline engine manufactured by this company was shown in two new models of 12 and of 24-horsepower respectively, in addition to the 15-horsepower model shown last year. The latter was shown by a chassis in operation, the wheels being elevated from the floor and an electric motor connected, which attracted much attention.

Both the new models were shown with side entrance tonneau bodies, and in addition a rough Limousine body for the 24-horsepower chassis was exhibited. The 24-horsepower has a wheelbase of 100 inches and weighs 2,150 pounds, while that of 12-horsepower has a wheel base of 81 inches and weighs 1,250 pounds. In most respects the two models are similar.

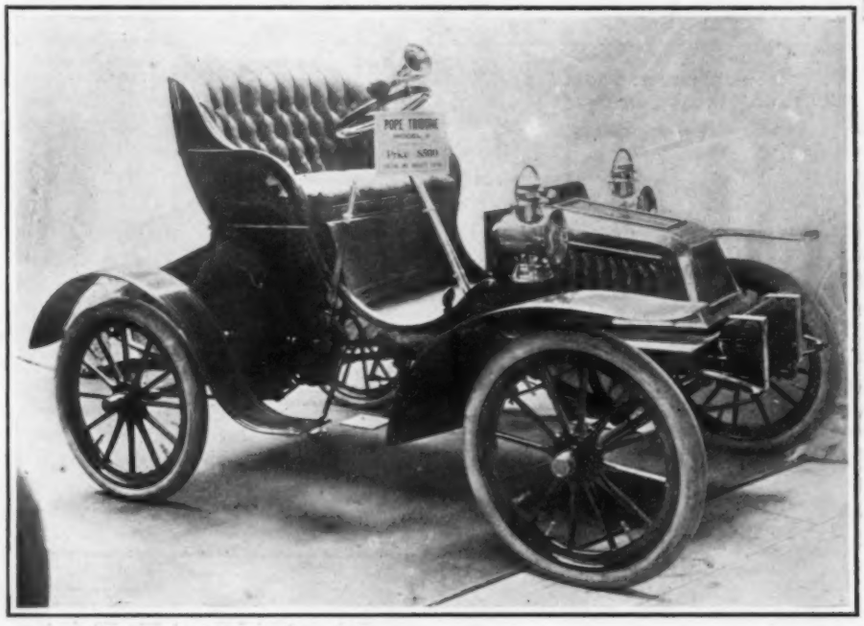
Hill Mfg. Company.—Canopy tops for automobiles are made by this firm and one was shown attached to an unpainted body.

Jackson Automobile Co.—Two new models of the "Jaxon" are shown, both touring cars, which show a number of new features. Both have side entrance tonneau bodies, one seating four passengers and the other five. The motor in both cars is the same, being two horizontal cylinders, but that in the larger car has a higher compression and develops 18 horsepower, while the engine of the four-passenger car develops only 16 horsepower. The engine is placed lengthwise under the body in both models.

A notable feature of the mechanism is that the application of the ratchet pedal operated ordinary brake disengages the high-speed clutch, and that the disengaging movement of the high-speed hand lever, vertical placed outside of the body, will, if continued to the extreme rear position, apply the reverse brake band. Thus, by the action of the ratchet and pawl retained ordinary brake pedal, a very quick single motion is made to apply the brake in the most effective manner, as this single pedal movement also disengages the high-speed clutch. Similarly the high-speed hand lever is made to apply the reverse brake band rather than the low forward speed brake band, which is the more usual combination. This gains another quick single movement clutch and brake combination, as the hand lever engages the high-speed in its forward position, and by the natural movement in the face of danger, the high-speed lever is rapidly pulled to the rear first disengaging the high-speed clutch and then instantly applying the reverse brake band, thus taking the forward drive off the car and at once applying the retarding effect of the reverse brake band. This is a safe proceeding, as the planetary gear is made unusually strong in order to serve as a brake in this connection.

The most notable feature of the detail dimensions is the very wide angle steel, 3x2x¼ inches, used for the chassis frame sides, which gives unusual vertical strength.

Knox Automobile Company.—A very interesting part of the Knox exhibit is relegated to the "Exhibition Hall," otherwise the basement, three fine samples of commercial vehicle. One of these, if the term be not a misnomer as applied to it, is a combination patrol wagon and ambulance built for the city of Springfield; a long covered body with fore-and-aft side seats, under one of which is stowed a folding stretch which may be hung by ball-joint suspension between the two seats, thus giving the easiest possible riding for an injured person. Under the other are stowed ropes and various implements.



ONE OF THE LOWEST PRICED CARS IN THE SHOW—POPE-TRIBUNE 6 HORSEPOWER RUNABOUT SELLING FOR $500.

A large furniture van is shown on an 18-horsepower chassis, two cylinders 5 by 7 inches, running on solid tires 32 by 3½ inches. The body with tail-board dropped takes a length of 130 inches, and a load of 2,500 pounds can be carried. The tires are solid, 32 by 3½ inches. A smaller car of 1,500 pounds capacity is shown with a Model E chassis, single cylinder, on the same size of tires. The body is completely enclosed, the car being intended for a well-known make of mattress, the width inside being sufficient for the mattresses to be laid flat without folding. The sides and ends are very handsomely decorated with the standard advertisement of the firm artistically reproduced in colors.

Logan Construction Company.—The new Logan car has the side-entrance body with running-board on a wheelbase of 90 inches,

STUDEBAKER ELECTRIC CHELSEA WITH FOLDING HOOD AT THE GARDEN SHOW.

the horizontal opposed motor being of 20-horsepower There are two speeds and reverse, with all gears idle on the direct drive high-speed. The chassis construction includes a system of diagonal braces converging to a point under the center of the body and distributing all longitudinal strains, conducing to easy riding and the life of the car. The front hood covers the tank and battery. A special feature is an individual key for every car by which the battery and gasoline are simultaneously cut off. The finish is in Brewster green with white stripe.

Mack Bros. Company.—"It solves the transportation problem," is the claim made for the big 20-passenger gasoline automobile shown by this firm. There are five cross seats, each holding four passengers.

Marion Motor Car Company.—The new model Marion air-cooled car has a four-cylinder vertical motor in front under a well-shaped bonnet, the body being a side-door phaeton on a 96-inch wheelbase with individual front seats. The body finish is dark blue with black moldings and gold stripe, black chassis and yellow wheels.

Merkel Manufacturing Company.—The Merkel motor cycles are shown, and at the same stand an optician tests the eyes and fits regularly ground glasses to automobile goggles.

Michigan Automobile Company.—The new 1905 car of 14 horsepower has the same type of fore-and-aft double opposed motor as in previous years, with wheelbase lengthened from 78 inches to 86 inches to give room for the phaeton body, *Roi des Belges* pattern, with side doors and running-boards. A neatly-shaped bonnet with radiator in front covers the tank. The chassis of this car is shown, also the complete car in Brewster green with coach red wheels; the standard runabout with rear-door tonneau attachment, wheelbase lengthened to 80 inches, is shown with crimson body with red wheels.

Napier Motor Car Company.—The Napier exhibit is in charge of Walter H. Wood, New York representative. Two cars are shown in characteristic Napier colors, green body finished in red and upholstered in red leather. A large side-door phaeton on a 28-horsepower chassis has two revolving chairs in the rear, seating seven in all. A Cape top in green leather extends over all the seats. A smaller car, of 18 horsepower, has the side entrance. The six-cylinder chassis, 30-45-horsepower, is shown.

Norman Motor Sleigh Company.—A few years ago New York at least would have shown but little interest in a motor sleigh, but the snowfall for this and the previous two years has been such as to make a demand for this new invention. The body is carried on four bow steel runners, movable for steering, the motive power being an air-cooled motor which operates a series of movable sprags, striking the snow or ice in a backwardly inclined direction. The speed is variable and brakes are fitted.

Oscar Lear Automobile Company.—The Frayer-Miller air-cooled car differs from all others of its class in the absence of radiating ribs, fins and pins and the use of air in a cylinder jacket, the circulation

FOLDING SEAT PRESCOTT—ONE OF THE FEW STEAMERS IN THE GARDEN.

forced by a blower and the cooling being due to convection. The 1905 car has a pressed steel frame carried on a cross spring in front; the four-cylinder motor is of 24 horsepower, with cone clutch and sliding gears giving three speeds and reverse. The motor is carried on an under frame and a pressed steel dash is used. The body is a side-door phaeton with running-board, finished in royal blue with chassis and wheels in automobile gray. Deep seats, wide doors, long bonnet and steering wheel make the car fully up-to-date in appearance.

Pierce Engine Company.—The two-cylinder, Pierce-Racine 16-horsepower car is of modern appearance, with motor under hood and radiator in front, the chassis being of steel angles. The wheelbase is 90 inches. The side door and running-board give entrance to a body with wide rear seat for three and individual front seats. This car is finished in sage green. The 8-horsepower, single cylinder runabout is shown.

Pungs-Finch Auto and Gas Engine Company.—A new model of the car formerly built by the Sintz Gas Engine Co., of Detroit, which has been absorbed by the Pungs-Finch Company, is exhibited, together with a chassis. The principal new feature is a side entrance tonneau body. The motor is of the four-cylinder vertical type of 22-horsepower located under a hood forward. The wheelbase is 96 inches, the weight 1,800 pounds. A 20-horsepower model is also built which has a wheelbase of 80 inches, weighs 1,750 pounds. The chassis exhibited was of this model.

Reid Manufacturing Company.—The new 1905 Wolverine car is an entire departure from that of last year, the horizontal opposed transverse motor is retained under the hood, which latter contains the radiator, but the body over a wheelbase lengthened from 82 to 88 inches, has the double side doors and running-boards. The motor is of 18-20-horsepower, with a separate direct-feed carbureter to each cylinder, and also a separate cooler for each. The body has a high back, handsomely upholstered, and is finished in royal blue, with gold and red stripe laid over a cream chassis and wheels.

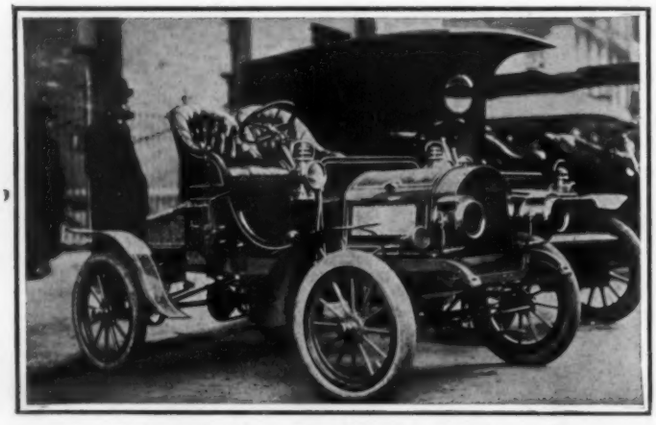
St. Louis Motor Carriage Company.—The familiar "rig that runs" is quite as well known in the East as nearer to its home, but the three-cylinder vertical motor in front is new to a New York show. The cylinders are in a single casting with water jacket of box form built around them. The car has a phaeton body with side entrance, deep back and wide seats, finished in green and gold with yellow wheels. The regular type of St. Louis phaeton, with horizontal motor, is shown in dark green.

Charles L. Seabury & Company.—There is evidently an irresistible fascination about the automobile which tempts every man of mechanical tastes, even though profitably engaged in work with which he is more familiar through long practice. The Seabury company has within a dozen years past expanded its business from the building of steam yachts and engines of moderate size to the designing and construction of every variety of fast floating craft, from the *Speedway* auto-boat and the big steam yacht *Kanawha* to the *Bailey* and other equally successful naval vessels. Not content with its success on the water, it has been for several years past interested in the development of the automobile, and within the past twelve months it has undertaken the manufacture of automobiles within its marine works at Morris Heights, New York. All the skill of the company in steam and gasoline engineering, fine machine work and complicated wood construction, with the enormous facilities of its great plant, have been concentrated on the new car recently described in detail in THE AUTOMOBILE, and of which the chassis is shown now for the first time. Though hidden in the side of the "Exhibition Hall," better known as the basement of the Garden, it is sought for and studied by all who are interested in the latest and best.

Upton Motor Company.—This new company, from Lebanon, Pa., shows a 30-horsepower four-cylinder car, with pressed steel frame and under-frame and a wheelbase of 100 inches. The motor is of very simple design, with all parts accessible, the cylinders being cast in pairs, sliding gears are used, with three speeds and reverse, ball bearings are fitted throughout, with a high-tension ignition system by magneto. The body is a side-entrance phaeton, finished in black with gold stripe.

Union Automobile Co.—A new car shown by this firm is a 16-horsepower touring car with a side entrance body which is remarkable for the fact that the engine is of the friction drive type, which has been consistently advocated by this company. The fly-wheel of the motor has a disc attached, the face of which is covered with a patent composition of metals characterized by its special friction qualities. The friction wheel is applied direct to the face of this disc plate on the fly-wheel by means of a foot ratchet and has a filling of paper or friction board. The shaft which carries this friction wheel is spaced parallel with the center of the friction plate on the fly-wheel. The friction wheel is moved in either direction on the shaft across the face of the friction plate by means of the controller lever. With the motor running at its greatest speed, the friction wheel is in contact with the extreme outer circumference of the friction disc and the vehicle is at its highest speed, and when the friction wheel is moved towards the center of the fly-wheel the speed will decrease to a standstill with the wheel in the center of the disc. If carried beyond the center the direction of the rotation of the friction wheel and the vehicle will be reversed. With this method of transmission, starting on either forward or reverse speed is entirely smooth.

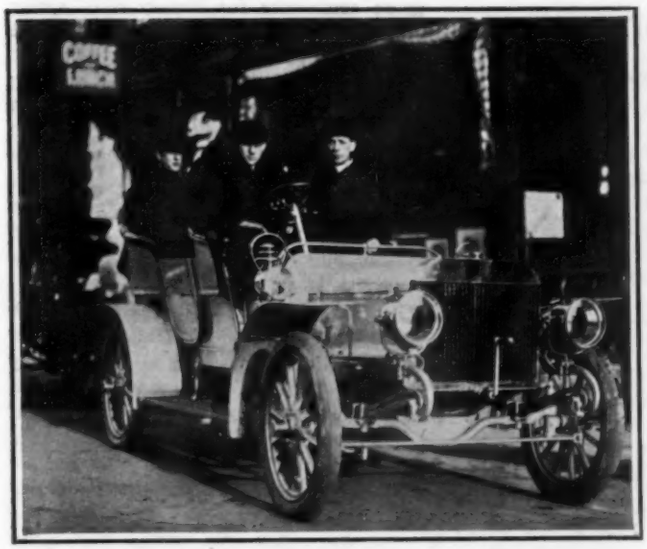
The motor which furnishes the power for this model is a 16-horsepower Lambert engine of the two-cylinder opposed four-cycle balanced type arranged horizontally. The crank is carried in the center of the motor with a cylinder at either end, both cylinders acting on the one crankshaft, which is of the double-throw type. A 12-horsepower model, with a rear entrance tonneau, is also shown.



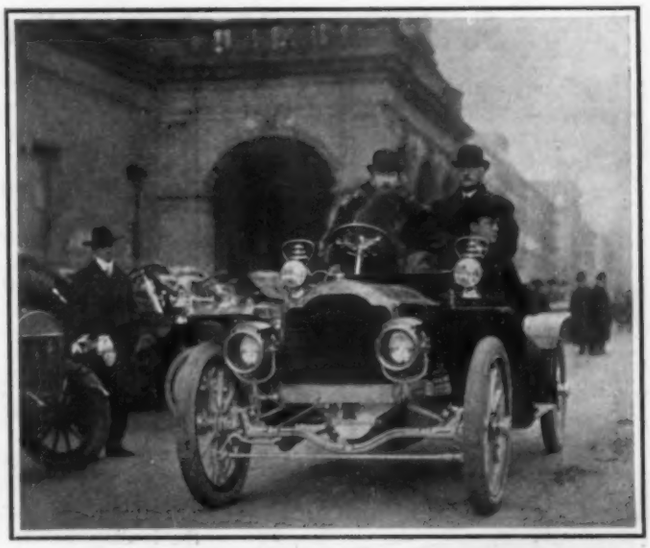
Mitchell Vertical Cylinder 9 Horsepower Runabout.

Smith & Mabley 30 Horsepower Side Entrance Touring Car.

TWO AUTOMOBILES THAT ATTRACTED MUCH ATTENTION AMONG THE DEMONSTRATION CARS OUTSIDE THE SHOW.



Ready to Start in the New Vertical Cylinder Winton.



Packard Touring Car with Rear Seats Removed.

Welch Motor Car Company.—The new pattern of the seven-passenger Welch touring car represents a complete departure from the large *Roi des Belges* rear-door tonneau shown last year; the present car having a combination "Pullman" limousine body with removable top, converting it into an open car at will. On casual view the body and top are a unit, no joints being apparent, but by the removal of four steel through-bolts the top may be detached. The body accommodates five in the rear, with a good fixed seat on each door. The pressed steel chassis has been lengthened to increase the wheelbase from 97 to 114 inches, and full elliptical springs have been added in the rear. A new style of front axle, giving a long bearing to the steering-knuckle, is used, with improved emergency brakes. The body construction is interesting, the entire back being bent with its sides from a single length of whitewood, the swell of the upper part being bent from a single length of thick plank and worked to shape from the solid. The front seats are of the round individual pattern and the doors are curved. The top is fitted with beveled plate windows in sides, back, front and door; the door glasses disappearing when the top is removed. The body is finished in English purple lake, with black moldings and coach red chassis; the interior is handsomely upholstered and fitted with electric light and radiator for heating. The motor is of 40-horsepower. A landaulet body in black, without chassis, built by the Willoughby Carriage Company, is also shown.

An excellent way to test wiring and other components of the high-tension ignition system is to run the motor in absolute darkness, when careful watching will disclose leaks to the eye, each escaping spark illuminating its own path.

In the opinion of A. M. Thackara, United States Consul at Havre, France, American producers do not supply as great a proportion of French wants as they might. He believes that if American exporters would use more systematic methods in bringing their goods to the attention of French buyers, a much larger trade in American wares would result.

Thomas Flyer with Glass Wind Screen in Place.

Characteristic Front View of the New National.

SNAPSHOTS OF EXPERTS GIVING DEMONSTRATIONS ON MADISON AVENUE, NEW YORK, OUTSIDE THE GARDEN.

Sundries on the Arena Platform.

THE number of exhibitors of parts, fittings and supplies is nearly half as large again as last year, there being about 150 exhibitors this year, as compared with 100 a year ago. As a result, the concert hall and every available gallery, box and nook, from arena platform to the roof, had to be pressed into service. Many of the spaces are almost inaccessible, the stairways being narrow and the passages constricted, rendering it difficult and annoying to make one's way to the uppermost exhibits. Lacking a general decorative scheme beyond the draping of strips of cheap colored bunting along the railings, with flags at intervals, it was impossible to do much in the way of decorative features, the smallness of most of the booths offering another obstacle in this direction. The quarters that many of the exhibitors were able to secure are so inadequate that not even a representative line of samples of products can be shown. A structure better adapted to the size and purposes of the automobile show is urgently needed, lacking which the solution for future exhibits seems to lie in the direction of a division of the show.

It is not for beauty and harmony of decoration, however, that visitors attend the show, and exhibitors are satisfied to know that agents and owners who are in earnest in their search for the newest and best are not deterred by such obstacles as narrow stairways and passages. The constant accession to the manufacturers' and agents' lines of sundries and their exploitation throughout the season leaves little of a really novel nature to be discovered at the show, although the great, comprehensive display is a most excellent place to refresh the memory as to what is in the market, and what articles have survived the test of practical use through the previous season.

There has been something of a revolution in tires in the last six months, the thread fabric having been adopted by several of the leading makers in place of the woven fabric, which it threatens to supersede in tires for racing machines, runabouts and the lighter electrics. French tire protectors and anti-skids, as the Samson and Le Marquis, prominently supplement the Bailey rubber-studded tread. Improvements in lamps are principally in the separate generators and in the adoption of the latest French type of gas lamp, with a lens carried in an internal spider in front of the flame. Pressed steel frames are exhibited by several firms, and show a rapid advance and great refinement over one and two years ago. The season's improvements in ignition apparatus take the form of devices intended to relieve the driver of a car from petty annoyances, as, for instance, tilting bridges on spark coils allowing ready inspection and cleaning of vibrator points without changing their adjustment, automatic connectors for battery cells, spring connecting plugs, double ended reversible spark plugs and so on.

The line of winter automobile clothing shows great extension and improvement in styles, folding automobile tops are better in appearance than before, and are now made in the extension type, to cover both seats of side-entrance cars. And so in nearly every line something of interest is found and general improvement and refinement are noticeable.

American Ball Bearing Co., Cleveland, O.—Exhibits of Cadillac, Olds and Ford front and rear axles, for light and heavy cars, are displayed, with the hubs removed from one end to show the cones of the ball bearings made by this company, which have been in the market for many years and are well known for their uniformity of size and metal.

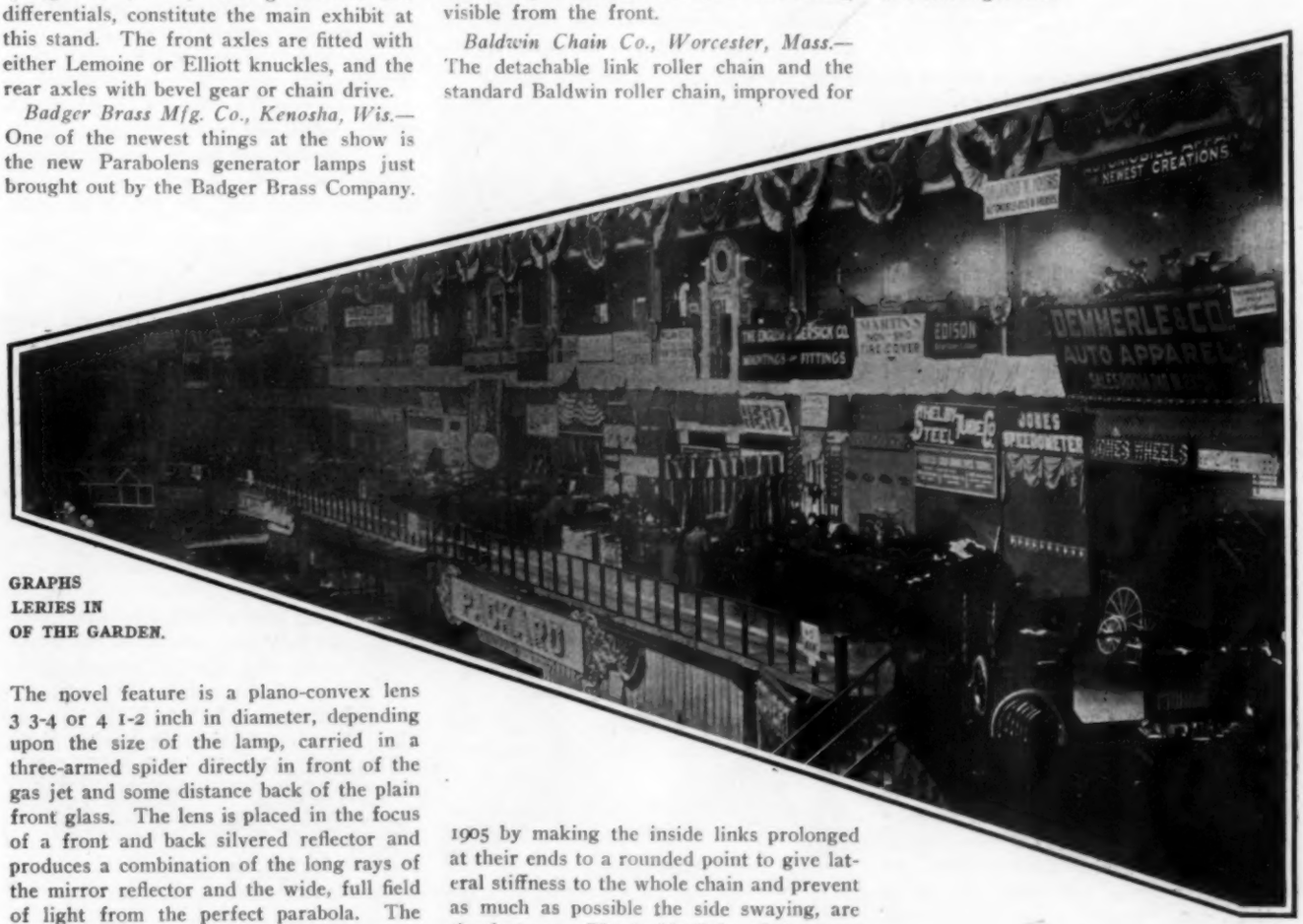
American Coil Co., West Somerville, Mass.—Autoboat men should be interested in the latest addition to the line of this company. It is a marine spark coil having a wood case with a hole in the bottom and legs at the four corners. The coil is designed to be placed on top of the engine cylinder, with the spark plug in the center of the head entering the hole in the bottom of the case. A spring inside presses a plate against the end of the plug and makes electrical connection with the coil. An aluminum case fits over the coil and rests on top of the cylinder, so that a bucket of water might be turned over the coil and engine without injuring the former or causing short circuiting. A new feature of the company's coils is a hinged bridge that can be lifted up for cleaning the vibrator points without disturbing their adjustment. Another new thing is the method of encasing spark coils. Non-conducting composition is molded in two halves of a rectangular case, in the center of which is placed the windings of the coil. The two halves are then hermetically sealed and the coil is weather-proof. For this season a battery has been brought out in which all the cells are automatically connected in series as soon as the binding strip is put into position. This binding strip has internal con-

PHOTO-
OF THE GAL-
THE MAIN HALL

nections, metal strips on the sides and binding posts at its ends. It is laid longitudinally across the tops of the cells when they have been placed in their box, and is locked in position by wing nuts. Spring wires extending out from the sides of the binding strip are sprung under the binding posts on the cells by "a simple twist of the wrist," and the series is all connected up without a binding screw having been turned. By the use of this device it is impossible to connect up a battery wrong, and there is no likelihood of poor connections or of connections coming loose.

American Roller Bearing Co., South Framingham, Mass.—Front and rear axles, complete with American roller bearings, spring blocks, hubs, steering knuckles and differentials, constitute the main exhibit at this stand. The front axles are fitted with either Lemoine or Elliott knuckles, and the rear axles with bevel gear or chain drive.

Badger Brass Mfg. Co., Kenosha, Wis.—One of the newest things at the show is the new Parabolens generator lamps just brought out by the Badger Brass Company.



GRAPHS LERIES IN OF THE GARDEN.

The novel feature is a plano-convex lens 3 3-4 or 4 1-2 inch in diameter, depending upon the size of the lamp, carried in a three-armed spider directly in front of the gas jet and some distance back of the plain front glass. The lens is placed in the focus of a front and back silvered reflector and produces a combination of the long rays of the mirror reflector and the wide, full field of light from the perfect parabola. The lamps are of a form and construction similar to the lamps that were most popular at the recent Paris salon, and the Badger people intimate that the combination of lens and reflector promises to displace the use of lens mirror reflectors.

A new type of Solar separate generator is offered this year. In it the generating chamber is entirely surrounded by a water jacket which keeps down the temperature of the gas, which goes to the burner in a dry state and produces a pure white light instead of a bluish or yellow one. The carbide is carried on top of a wire sieve at some height above the bottom of the generating chamber, and water from the upper reservoir is fed down to it. As the gas is generated the ashes are sifted down through the sieve by the vibration of the lamp, keeping the carbide clean. The water in the jacket is entirely separate from that in the reservoir, so that the heat is not communicated to the latter.

Fifty or more samples of Solar gas and oil lamps are exhibited, making one of the most complete lines manufactured in the country. There are swivel searchlights, large gas headlights with self-contained and separate generators, side gas and oil lamps, oil tail lights. A prominent feature of the display is a naval swinging searchlight, and for launch use there is a combination lamp showing white in the center, red on one side and green on the other, all three being visible from the front.

Baldwin Chain Co., Worcester, Mass.—The detachable link roller chain and the standard Baldwin roller chain, improved for 1905 by making the inside links prolonged at their ends to a rounded point to give lateral stiffness to the whole chain and prevent as much as possible the side swaying, are the features. The inside links of the standard chain are made with nicely-rounded edges, with the object of assisting the chain to easily find its seat on the sprocket even when the two sprockets are not in correct alignment. This not only prevents the chain riding up on the sprocket and breaking or jumping off, but also prevents excessive wear and cutting of the links by the sprocket teeth. The new detachable chain possesses this same feature as well as the extended side link ends.

Brennan Mfg. Co., Syracuse, N. Y.—An angle steel frame fitted with a Brennan opposed horizontal motor and sliding gear transmission is a new feature of the Brennan exhibit this season, as is also a four-cylinder vertical motor. Each side of the frame is built up of angles riveted to a central strip of quarter-inch steel so as to form a double channel section. The chassis has a cone clutch and the water pump is driven off the flywheel by a pulley. The display embraces in addition opposed two-cylinder Brennan motors of 8, 12 and 16 horsepower, some fitted with planetary change speed. The cylinders of the four cylinder engine are cast separately, the inlet valves are automatic and the spark plugs are in the centers of the heads. Incidental to the engines and chassis, are shown such parts as the Brennan automatic carbureter, crankshaft, valves, connecting rod, cams, and starting crank.

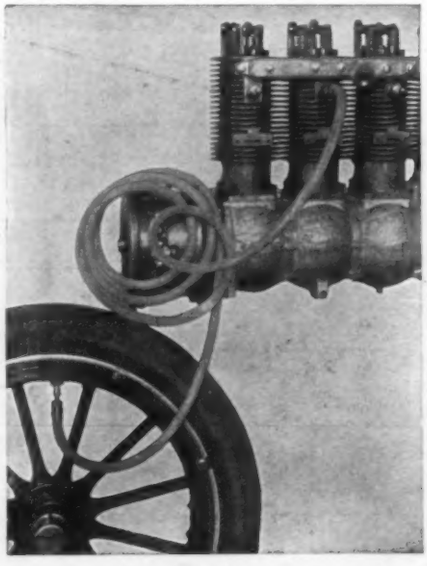
Brown-Lipe Gear Co., Syracuse, N. Y.—A new model that has been added this season to this company's line of nine or more different styles of spur equalizing gears, all of which are displayed on a standard at the front of the booth on the arena platform, is the Model 1 Special. This is made like the original Model 1, which was brought out four years ago, but has six sets of spur pinions instead of three, and is built stronger, so that the size is not much if any greater; the strength is doubled. The Brown-Lipe gears are made for center chain and bevel gear drive, and some are fitted with one and others with two con-

stricting brakes. The company is introducing this winter an entirely new device called the Bolster automatic pump, invented by Mr. Bolster, of the Fisk Rubber Co., and made by the Brown-Lipe Gear Co. It consists of merely a twelve-foot piece of rubber hose, with a tire valve coupling at one end and a brass screw threaded coupling at the other adapted to be screwed into the head of any one of the cylinders of a multiple cylinder engine in place of the spark plug. When the engine is started this cylinder acts as a pump to inflate the tire on any one of the wheels. A ball check valve prevents back flow of the gas into the cylinder on the suction stroke.

Briscoe Mfg. Co., Detroit.—Among the many styles and sizes of radiators shown by this Detroit house that has just acquired a large plant in Newark for the better handling of eastern business, is a sample of the new cooler that is to be made exclusively for the Olds cars this season. It is built up of thin flat water tubes arranged transversely and held in position by interposed corrugated pieces so disposed as to form diamond shaped passages for the air from front to rear of the cooler. The radiator presents the honeycomb appearance and provides 54 1-2 square inches of radiating surface for each square inch of front surface. Several forms of the new staggered tube radiators that are in use on many of the well known small cars for 1905 are shown. In these three round transverse tubes of 5-8 inch size are inserted in copper fins having three holes for the reception of the tubes and cut with diagonal ends so that when the tubes are assembled in the cooler, with the edges of the fins in the front and rear planes of the cooler surfaces the three tubes will be in different planes, the rearmost one uppermost. Thus each tube is presented directly to the current of air as it passes through the cooler. Another new type is made with flat tubes laid horizontal in square discs which give to the radiator front the appearance of the Panhard cooler. The company is bringing out and hopes to have on exhibition before the week ends a new honeycomb form of radiator similar to the familiar Briscoe honeycomb but having smaller holes and wider water spaces and being deeper by half an inch. Several styles and sizes of folding hoods for motor-front cars and hoods with doors in the top for cars with horizontal motor cars are shown, together with a line of aluminum and iron mud fenders.

Columbia Lubricants Co., New York.—Cans and pails of Monogram oils and greases constitute the exhibit of this New York concern. The lines comprise light and heavy cylinder oils for gas and steam engines, graphite and yellow gear and motor greases, non-liquid oil, and Monogram metal polish put up in cans of convenient sizes, to be used for cleaning and polishing the metal parts on a car. The company is showing at its booth a Monogram "oil gun," which it is offering for the convenience of its customers. It has a ten-inch brass barrel 1 1-4 inches in diameter with an oil spout at one end and a handle at the other carrying a plunger rod to the end of which is fixed a wide cork plunger. The end of the plunger rod carries a nut and washer, the screwing up of which expands the cork when it becomes worn or loose in the barrel. In addition to its agencies in the largest American cities, the company has opened a London agency and is now negotiating for one in Paris.

Consolidated Mfg. Co., Toledo, O.—Drop forged halves of I-section front axles, with dropped centers, drop forged two and four-thrown crankshafts, steering knuckles and I-section connecting rods are displayed by this concern, which is successor to the Snell Cycle Fittings Co. There is an exact-



BOLSTER AUTOMATIC PUMR CONNECTING CYLINDER WITH TIRE VALVE.

ness and nicety about the forgings that leaves little surplus metal to be machined away.

Dayton Electrical Mfg. Co., Dayton, O.—The Apple improved igniting and lighting outfit, which is mounted on a dummy dash at the front of the stand and is demonstrated in operation, with a spark gap for each of four cylinders, attracts much attention. The outfit comprises an Apple igniter, inserted through the upper right corner of the dash, a single spark coil and an Apple secondary crurent distributer. The distributer is made of hard rubber and has no metal parts exposed to the high tension current. Apple igniters and Apple magnetos are shown at a table in the center of which is a flywheel made to rotate at high speed by an electric motor. Two igniters are mounted with their conical friction pulleys in contact with the beveled edge of the wheel, and current from one is led to a spark coil to the terminal of which are fixed short copper wires bent toward each other to within a distance of 3-8 inch, then vertically. A constant play of electric sparks between them draws many spectators.

A new thing with the Dayton people this year is a new storage battery of 30 ampere hour cells built up in sections for any amount of current desired. The cells are entirely encased in a lead body and have a small rubber tube connected with the gas vent at the top of the cell and leading down along the side of the cell inside the battery box through a hole bored in the bottom and through similar holes in the bottom of the car or the running-board. Thus the fumes are carried off at the bottom and cannot attack the connections. A new gang force-feed oiler, called the Autohavit, is shown at the back of the booth. The reservoir carries at the top an oscillating arm having any required number of threaded bolts arranged to strike an equal number of plungers arranged vertically at the front of the reservoir. The stroke of each plunger is limited by means of the bolt tappets, which have lock nuts and can be screwed through the oscillating arm as far or as little as desired.

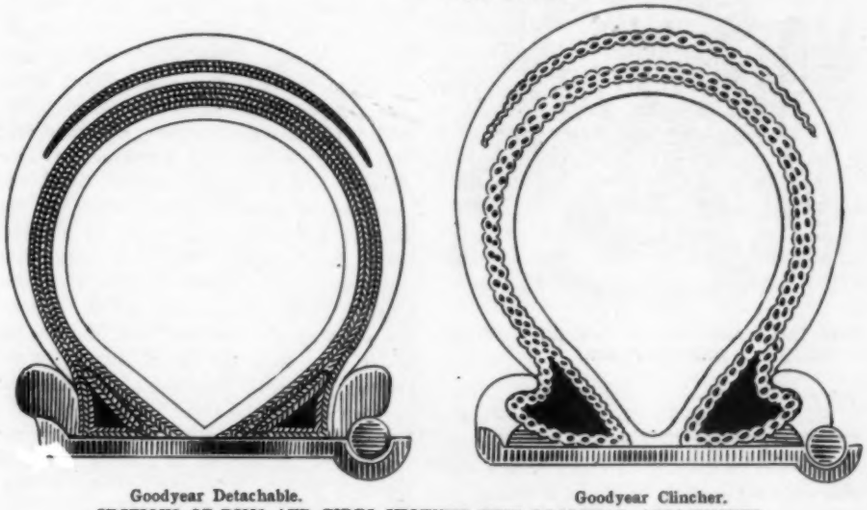
Dow Portable Electric Co., Braintree, Mass.—New features at this stand are a sectional dashboard coil, from which any of the units can be quickly removed without disturbing the others, a tilting bridge carrying one of the vibrator points on the coil, which can be unlatched and raised in a second for examination and cleaning of the vibrator points without disarranging the adjustment of the points, and a spring connection for the wire terminal. The last-mentioned device has a round metal plug telescoping in a little metal tube protruding from the coil. The plug is forced outward by a coil spring in the tube. Both the tube and the plug have a small hole bored transversely through them, and these holes coincide when the plug is pushed inward against the tension of the spring. The wire terminal is then passed through the hole and the plug released, when the tension of the spring retains the wire in place. The units in the separable coil are held firmly in place by means of a steel rod across their tops, which acts as a common ground. This rod has a spring button at one end that engages in an eyelet in one end of the case and holds the rod in position. The terminal connections of the coil pass through the base of the case, which is made for attachment to the dash. The Dow timer, with roller cam, and the new Dow. No. 1 and No. 2 switches are also prominently displayed. The switches have hard rubber cases covering all metal parts, nothing protruding but the locking plug, which can be withdrawn to completely break the circuit.

Firestone Tire & Rubber Co., Akron, O.—Solid rubber tires in sizes from 2 1-2 to 8-inch width are shown, some of the smaller sizes fitted to steel rims and one of the largest on a heavy distillery truck wheel.

The tires are held on the rims by means of detachable side wires that rest on the flanged edges of the tire into which protrude the ends of transverse wires embedded in the rubber and fabric base of the tire. Prominently displayed at the front of the booth in a dark frame is the blue ribbon and certificate of award of the gold medal for superior excellence given by the jury of awards of the Louisiana Purchase Exposition.

Fisk Rubber Co., Chicopee Falls, Mass.—Three Fisk detachable tires 30 by 3 1-2 and one 30 by 4 1-2 inches are mounted on standards for convenient inspection and for demonstration of the Fisk mechanical fastening by means of eight transverse bolts and two steel wedge rings fitting on a flat rim. An improvement has been made for 1905 by substituting T-bolts and unthreaded washers for those formerly used, thereby avoiding corrosion and difficulty in removing the nuts and bolts. One tire is shown with a Bailey rubber studded tread and another with a leather cover studded with metal rivets, like the Samson tire protector and anti-skid.

Garlick Auto Prop Co., Paterson, N. J.—One of the simplest new things at the show is the short wooden tripod displayed by this concern. The three legs are fastened together at their upper ends by means of angle plates. The tripods, called Auto Props by the makers, are offered in sets of four, to be placed under the axles of cars for the purpose of relieving the tires of all weight while in the salesroom or garage.



Goodyear Detachable. Goodyear Clincher.

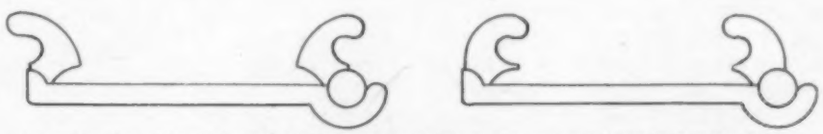
SECTIONS OF RIMS AND TIRES SHOWING NEW GOODYEAR ATTACHMENT.

Gleason-Peters Air Pump Co., New York.—Practical utility is combined with display here by connecting a long rubber hose from a triple cylinder air compressor to one of the Gabriel duplex horns, shown in a booth in the balcony above the Gleason-Peters display. Many visitors throughout the great main hall wonder, when they hear Gabriel's horn, where the air comes from to blow such a big noise maker. The triple cylinder compressors, which are especially suitable for garage use, are made in low-pressure type compressing to 75 pounds to the inch, and high-pressure, with water-jacketed cylinders, compressing to 300 pounds.

The most complete line of tire pumps at the show is displayed by this concern, embracing small hand pumps with one barrel 20 inches long, that will pump to 200 pounds pressure, the original No. 4 toggle lever pumps, that deliver thirty-four cubic inches at every stroke, and various other types. An interesting hand pump that has been very successful during the past season is the 1-inch and 1 1-4-inch barrel. The foot stirrup folds up against the barrel, and the handle is cast hollow from brass. The plunger rod is pivoted into the hollow, and when not in use the handle is turned up in the longitudinal axis of the barrel and the end of the handle screwed into a thread in the barrel-cap, which holds its rigidity so that the pump can be handled without having the plunger rod slide out.

The newest article shown is an oiler made in the form of a pump, with cork plunger folding handle and stirrup pump, made with and removable annealed tapered spout. It is made in long and short sizes, and the cork can be expanded by screwing up a nut on the end of the plunger rod.

B. F. Goodrich Co., Akron, O.—The regular Goodrich clincher tire, made with thread fabric instead of woven fabric, which was brought out only last fall, is being brought to particular attention at this year's show. The construction is similar to the Palmer tire, but is applied to the double tube clincher type of pneumatic. Another special exhibit is a Goodrich tire with a Bailey tread. The tread of the tire is molded with soft rubber projections or studs thickly disposed on the surface. These make a most effective anti-skid until worn off. It might be supposed that this wearing would be very fast, but it is stated that a set of these tires fitted to a car in the Boston contingent went all the way through to St. Louis in the St. Louis tour last summer and the studs had not worn entirely off, notwithstanding the very bad roads and hard driving. In solid tires the company exhibits molded with rubber buttons, or studs, the Turner endless, the Goodrich side-wire, and the Goodrich two-wire internal types. All the Goodrich tires to be used in the Florida tournament next week are to be of the new thread fabric construction, and J. H. Sheldon, manager of the company's tire department, is going down to the tournament to observe their work and take care of the company's interests.



SECTIONS OF GOODYEAR RIM WITH REMOVABLE RING FLANGES FOR DETACHABLE AND CLINCHER TIRES.

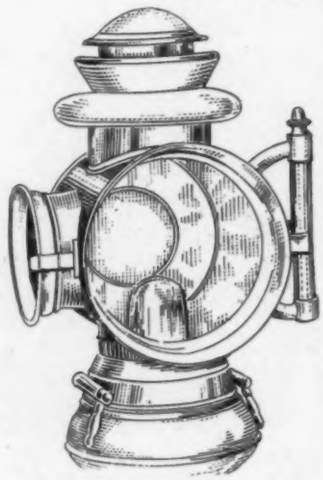
Goodyear Tire & Rubber Co., Akron, O.—Without doubt one of the most interesting of the new things among the parts and accessories is the new Goodyear universal rim. For simplicity and ease of attachment and detachment of the tire this device is probably unsurpassed. The rim is adapted to take either the Goodyear flat-base tire, the Goodyear clincher tire of G & J section, the new Goodyear endless solid rubber scolloped tread tire, or the Goodyear clincher solid rubber endless tire. The rim has a flat base, with a rounded flange on one side and a semicircular groove on the other, adapted to take a 3-8-inch wire ring. Ring flanges slightly grooved on both sides of the base to conform to the curve of the wire ring are rolled with an easy curve on one side and a bead on the other to fit over the bead on the edges of a clincher tire. These rings exactly fit over the flat rim and are reversible. One of them is slipped over the rim until its base abuts against the flange on the rim. The tire is then slipped over the rim, with the inner tube deflated, and the second ring flange is put on. The split wire ring follows, being pressed down into the semicircular groove all the way around. Nothing more remains than to inflate the tire. The pressure of the base of the tire and the air pressure force the flange ring outward against the wire ring, clamping the latter firmly in the groove. Even if the car is driven with the tire deflated, it is claimed that the pressure of the base of the tire against the flange rings will prevent the wire ring from coming loose. In one position the flange rings form a suitable channel for a flat-base tire, and reversed they form a channel for

a beaded clincher tire. The steel rim is galvanized, the flange rings are nickeled and the wire ring is coppered or galvanized to prevent rusting. No tools whatever are required for removing and replacing a tire, and one minute's time suffices to perform the operation, a fact demonstrated repeatedly at the show. The Goodyear detachable tire is now being made with thread fabric instead of woven fabric. The contractible wire bands in the edges of the base are retained to clamp the tire to the rim when inflated, thereby preventing creeping, with its consequent evils. The company has brought out a solid tire of cross section and corrugated tread, resembling the Swinehart, but having a scolloped tread like a sectional tire, which, it is pointed out, permits expansion of the rubber in four directions instead of two.

Gray & Davis, Amesbury, Mass.—The complete line of oil and gas lamps made by this company is attractively shown in white wood and glass show cases arranged around the front and sides and rear of the booth. The line is most extensive and the display embraces nearly 100 lamps. The Bullet form of side lamps and headlights forms a prominent feature. The swivel searchlight is also featured. There are lamps with self contained generators, lamps with separate generators, large and small oil side lamps, and oil tail lamps. A feature that characterizes the G. & D. side lamps is the section of colored glass at the top of the front glass, red for the left side and green for the right side, as in marine use.

G & J Tire Co., Indianapolis.—The new thread fabric detachable tire is "the whole show" at this stand. The complete tires fitted to wheels mounted on standards look no different from the familiar corrugated tread G & J tire of old, but on a small table are shown pieces and sections of the new tires. The principle of the new tire is the same as that used so successfully in Palmer single tube bicycle tires—threads laid diagonally side by side but not touching each other, then covered with a layer of rubber on top of which is laid another series of threads at right angles to the first. This process is continued until a sufficient number of layers has been built up, interspersed with thin layers of rubber. When the built up tire is put under enormous pressure and vulcanized, every thread is surrounded by soft rubber which prevents it coming into contact with the adjacent threads, thereby eliminating the internal friction that heats the tires so quickly on racing machines and wears out a tire internally sometimes before the rubber of the tread has been worn out by contact with the road. In addition to this enormous advantage, the absence of interwoven fabric allows the walls of the tire to move appreciably in any direction under extraordinary pressure, as in passing over a stone, while at the same time there can be no enlargement of the diameter of the tube. Put more briefly, the tire has an unusual degree of resiliency and "life," making it fast and contributing to the easy riding of the car. So successful has this new tire proved since it was first brought out last summer that the G & J Co. has abandoned entirely the use of woven fabric in its tires.

C. T. Ham Mfg. Co., Rochester, N. Y.—This firm of well-known house lamp and lantern makers makes its first appearance at an automobile show this winter with a line of Cold Blast oil lamps for side lights and rear lights. These are built on the tubular cold blast principle, the supply of fresh air being taken in at the top of the lamp around the chimney, drawn down around the walls of the burner chamber, which has double walls, and fed up to the burner through a series of holes around its base. As a result of this construction the flame burns steadily and no wind short of a cyclone is strong enough to blow it out. The flame also has less of the yellow color that characterizes kerosene lamps. These lamps have hinged reflector at the back as well as hinged glass fronts, and the reservoir, burner and wick are quickly re-



HAM TAIL LAMP WHICH CAN BE USED AS HAND LANTERN.

movable, facilitating cleaning and filling. A pleasing feature of the Ham rear lights, which are made in two styles to throw white light on the step of rear entrance and side entrance cars, is the bracket socket on the side, which is made in the form of a handle, so that the lamp, which is light but which gives a strong light, can be used for inspecting the machinery or tires without inconvenience in handling.

Hartford Rubber Works Co., Hartford, Conn.—This concern has two exhibits on the arena platform, having taken the space reserved by the India Rubber Co., which has been bought out recently by the Hartford concern. In both spaces are exhibited the Perfected Dunlop detachable tires in 30 by 3 1-2 and 30 by 4 1-2 inch sizes, fitted to wheels mounted on standards for demonstration purposes. Attendants repeatedly take off and put on the tires to show interested spectators how easily and quickly the operation can be performed by means of the hollow metal side rings, which are tightened into place in their grooves in the metal rim by means of turnbuckles. Metal covers 2 1-2 inches in length slide along the rings to cover the turnbuckle and keep the holes in it free from dirt. Features of the exhibits in both booths are rear wheels off the Columbia car that made a record run from Chicago to New York, each fitted with a Dunlop Perfected tire that was used on the trip. Hartford clincher tires of G & J section are shown in one of the booths, and samples of detachable tires with Samson steel studded anti-skid leather covers vulcanized on are a new feature.

Herz & Co., New York.—A Herz distributor for four-cylinder ignition with the use of only one coil is shown in operation on a dummy dashboard. The *bougie* Mercedes is also a new addition to the line. The insulation of the plug is of a special stone, pressed and baked at a temperature of 2,000 degrees, so that it will stand high temperatures without cracking. The connection to the current conducting cable is by an annular revolving copper connector threaded onto the end of the plug. There are also shown spark coils, wire terminals, ignition cable and other ignition apparatus.

Le Marquis Tire Co., New York.—The Le Marquis leather covered tire shoe, made with protruding steel rivets in the folded over tread is shown in two places on the platform by the above named company, which has secured the sole American and Canadian rights to this new product introduced at the Paris salon last month. The device, which was illustrated and described in THE AUTOMOBILE for last week, has four plies of chrome leather on the tread, the inner layers protecting the rubber of the shoe, to which the leather envelope is vulcanized, from wear on the rivet ends. Another important feature of this device is that the leather extends all the way around the sides of the tire and over the beaded edges, preventing the rim cutting and wear that so frequently destroys a tire before it is worn out on the tread. The rivets have large steel washers on the tread to take the wear there and present an efficient anti-skid tread.

Light Mfg. & Foundry Co., Pottstown, Pa.—That the public has not yet become accustomed to the remarkable lightness of aluminum is well shown at this company's stand, for nearly every visitor who hesitates in front of it long enough to catch sight of a small crib of aluminum bars cannot resist the inclination to "heft" one of them. Large and intricate aluminum castings, which are a specialty with the company, are used in place of a rail to close off the booth from the promenade, and on a stand in the center of the space are smaller castings of aluminum, phosphor bronze and brass. Surmounting the top of the pyramidal stand is a small model of an automobile made up of stock castings, and a very surprising similarity it bears to the real thing.

The exhibit embraces large crank and gear cases, in aluminum, carbureter and water pump parts, aluminum cone clutch and ammeter and voltmeter cases, bronze gears, steering gears, operating pedals and brass hub caps and similar parts.

C. A. Mezger, New York.—Soot Proof spark plugs constitute Mr. Mezger's exhibit. This plug has two air gaps between the center spindle and the outer shell, the end of the spindle in the cylinder being centered in an axial hole in the end of the porcelain. The shell and spindle are carefully insulated with porcelain and the joints made tight with packing rings and washers.

Midgley Mfg. Co., Columbus, O.—The well-known pressed steel built-up artillery wheels, dip brazed into one integral unit are displayed in front and rear wheel types, and with rims for the G & J section clincher tires, for the Dunlop Perfected tires and with flat rims. Wheels are shown in the rough and enameled in red, white, blue and black. Various parts of the wheels are displayed on a table to illustrate the methods of manufacture.

National Carbon Co., Cleveland.—Columbia dry cells, Auto cells, Multiplex batteries and Rex closed circuit cells are displayed for use on automobiles.

New York & New Jersey Lubricant Co., New York.—Non-fluid oils and greases are displayed in small glass jars on the table at the front of the booth, while at the rear of the stand are cans and pails of the company's well-known products for making smooth the way of the motorist. Non-fluid oils are made in two gravities especially for general use on automobiles, the K No. 000 especially prepared for use in compression grease cups, and for packing differential gear cases, steering gear cases, and ball and roller bearings, and K No. 00 special for use in place of fluid oil in transmission gear cases and on electric vehicle motors where fluid oil is likely to get onto the armature and cause short circuiting. The company is also showing the N. F. O. lubricant gun, a brass-barrelled pump with a tapered and curved nozzle which furnishes a convenient and economical means of applying lubricants to automobiles, launch engines and other kinds of machinery. The cap end of the barrel has two finger loops that enable the gun to be held and worked with one hand. The N. Y. & N. J. company claims to be the originator of this feature, and has patents pending on the gun in Washington.

Parish & Bingham, Cleveland, O.—Nothing characterizes the 1905 show more than the improvement in appearance and the increased number of pressed steel frames, a result for which Parish & Bingham are in no small degree responsible. It is fitting, therefore, that the prominent feature of the Cleveland firm's exhibit should be a standard supporting four assembled pressed steel frames and two pressed side members. The frames are of different sizes and types, the smaller having side members 3 1-2 inches deep in the middle sections and the larger 4 1-2 inches deep in the middle. Three of the frames have straight side pieces, and the fourth is reduced in width at the front. The last mentioned has the spring shackles attached at front and rear, and has a dropped front cross piece and dropped longitudinal members to carry the engine. All the frames are reinforced at the corners with triangular plates riveted on. On a table at the front of the booth are displayed smaller samples of pressed steel pieces, such as parts of frames, clutch cones, brake bands, hub plates, sprockets and an eight-inch steel hemisphere. All the samples are clean and bright.

Pope Mfg. Co., New York.—Columbia, Cleveland and Rambler motorcycles remain in general as last year, the distinguishing characteristics of each line being retained. The Columbia and Cleveland have the long wheel-base and spring chain sprocket, the Kelecom carbureter and the front wheel brake, and the Rambler, which is made of Thor fittings, has a spring or cushion front fork. The new feature of the exhibit for this season is a tandem attachment, shown fitted to a Cleveland motor-cycle. This has stays from the seat post reaching down past the rear axle, over the ends of which the stays are held by nuts taking the place of the step. A horizontal bar connects the rear seat-post clamp with the front seat-post, which carries the handlebar for the second rider. Below the hub of the rear wheel are foot rests for the second rider.

Shelby Steel Tube Co., Pittsburg, Pa.—The very extensive line of forms and sizes of cold drawn steel tubing, produced by this company is shown in a large glass covered case containing hundreds of sections from such tubes—round, square, oval, D-shaped, polygonal, and even octagonal insides with round outer section, in sizes from ⅛-inch to 7 inches. Samples of inch tubing tied into various kinds of knots while cold, are shown to demonstrate the toughness of the metal. Heavy axle sleeves cupped at the ends and swedged tapering are shown also, together with complete front axle tubes with dropped centers.

Standard Welding Co., Cleveland, O.—New departures this year with this concern are the welding of pure nickel to steel and the welding of Tobin bronze. The steel and nickel tubes are made of semicircular lengths pressed to shape and welded edge to edge by the electric fusion process, the burr along the line of union being ground off. The nickel and steel tube lengths are butt welded. When ground and polished there is no definite line of demarkation between the two metals, which are perfectly united. Samples of welded drop forgings, such as transmission shafts, controlling levers, steering knuckles, steps and a variety of parts are displayed. The first order for welded steel bottles for compressed acetylene gas was taken early in the week at the show.

Timken Roller Bearing Axle Co., Canton, O.—Complete front axles with Lemoine and Elliott type steering knuckles, and rear axles with bevel gear and chain drive, constitute the leading features. The bearings throughout are of the Timken tapered roller type. One type of rear axle carries all the weight of car and occupants on the sleeve, the live shaft merely transmitting the power from differential to hubs. The differential housing is split horizontally, giving free access to all parts. All gears are hardened. Tapered roller bearings are used in the pinions and also at four other points, taking all the weight and also lateral thrusts. Timken axles were awarded the gold medal at the St. Louis exposition. The company has just undertaken the manufacture of heavy truck axles, the front axle of I-section, for trucks of one to ten tons, either with Archbold hubs or boxes for Sarvent wheels.

20th Century Mfg. Co., New York.—Especial attention is being called to the full line of separate acetylene gas generators furnished by this house, to go with its extensive line of gas head lamps and searchlights. The latest addition to the line is not a generator at all, but a small steel bottle, about a foot long by three inches in diameter, and weighing probably five pounds in which is supplied compressed gas sufficient to burn fifteen hours. These are sold at low prices as compared with the larger steel tanks heretofore sold, and they are being placed in the hands of agents in all parts of the country, so that the owner of a car can take an empty to his dealer and get a filled bottle for half a dollar. The line of generators includes the Billy type used in France, the water drip form, and an entirely new type made on a new principle as applied to automobile lamps. In the last named, finely ground calcium carbide is placed in a funnel-shaped cup. Across the wide top of the funnel is a rubber diaphragm to the center of which is attached a rod that depends down through the funnel and carries a cone that stops the small opening. A spring on top of the diaphragm normally depresses it and permits the ground carbide to sprinkle through into a large reservoir of water below. When too much gas is generated, the pressure on the lower side of the diaphragm forces it upward and closes the valve, stopping the dropping of carbide. Besides generators, the exhibit includes swivel searchlights for automobile and marine use, gas head and side lights, oil side and tail lamps and motorcycle acetylene lamps, in a variety of styles and sizes.

Veeder Mfg. Co., Hartford.—Tachometers for indicating the speed of an automobile in miles per hour and of rotating machinery shafts in revolutions per minute form the prominent feature of this company. On a stand are shown these instruments in various sizes and styles connected to small shafts rotated by a small electric motor. They are so sensitive that the vari-

ation of speed of the shafts due to fluctuations of the electric current can be plainly noted by the slow rise and fall of the pink alcohol in the glass gauge. The instruments measure speeds from 0 to 60 miles an hour and from 0 to 2,000 revolutions per minute. The speed is indicated by the height to which the liquid column is forced by a centrifugal pump attached at the other end of a flexible hose and driven by spur wheel from the hub of the front road wheel. A tachometer is shown mounted on a dummy dash board and connected up to a set of Knox wheels and front axle. The wheels are revolved by an electric motor, and while the tachometer is connected to one wheel a Veeder odometer is connected to the other by a flexible shaft, the recording instrument being attached to the dash. At the rear of the space is a show case filled with different forms of attachments for the tachometer to different makes of cars. A season odometer and a combined season and trip odometer are mounted on a stand with a small electric motor for demonstration purposes, and on a similar stand is a Veeder counter with oscillating arm for attachment to presses and similar kinds of machinery for recording impressions.

Weston-Mott Co., Syrcause, N. Y.—A pair of artillery wheels, mounted on steering knuckles of the Elliott and Lemoine types, one with universal ball-jointed steering connection and the other with a plain pivoted connection, occupy a prominent position at the front of the Weston-Mott exhibit. In addition to the steering knuckles there are shown a rear axle with live shaft and three arm spider, embracing the differential and a tubular front axle assembled with its steering knuckles of the Elliott type. There are also a number of steel wheel rims, coppered, and hub plates, hub caps and differential housings.

Whitney Mfg. Co., Hartford, Conn.—Familiar as it is to old attendants at the Garden show, the standard showing a series of Whitney chains and sprockets connected up with a carefully calculated gear reduction, so that while the small chains and sprockets at the left end run rapidly when driven by an electric motor, the large chains at the right end turn so slowly that the movement is scarcely perceptible, yet the exhibit is of interest because it embraces the new Whitney cotter detachable roller chain, the Wizard chains and sprockets for circulating pumps, fans and magnetos, and other and older types of block and roller chains. From a shaft above, driven by chain from the lower shaft, are pendent a series of chains having sprockets in the loops.

Miscellaneous Concert Hall Exhibits.

IN the concert hall at the Madison Avenue end of the building were located a number of exhibitors of parts, accessories and supplies, who were not particularly well pleased with their positions. The sequestered nook occupied by the hall was entered through a dim portal, which was hidden from casual view by heavy portières at the back of the band stand. If the visitor succeeded in finding his way through the tortuous passages and entered the concert hall, he immediately found himself in a depressing atmosphere, the result of the lack of decoration which gave the room a blank, bare aspect, and the inadequacy of lighting, as a further result of which many exhibits were in semi-obscurity, and the photographing of the hall was an impossibility. Many persons passed the doors without noticing that there was an exhibit within, and many who desired to see exhibits there wandered all over the Garden without finding what they sought, unaware of the location of the hall.

Some of the manufacturers in this place are of considerable importance in the automobile trade, and a number of new and meritorious devices were shown to the few who were there to see. Some of these were new appliances in which much interest has been taken by the press and the public, and which were on exhibition for the first time. The dominant note of this portion of the show was practicability and utility, and it is noteworthy that in this one corner of Madison Square Garden it was possible to obtain everything necessary to construct a complete automobile from the ground up, with the exception of the body, equip it with practically every modern appliance, and then clothe the chauffeur and the passengers in appropriate garments.

Following is a résumé of the concert hall exhibits:

Aurora Automatic Machinery Co., Aurora, Ill.—The manufacturers of the Thor motors and motor-cycle fittings exhibited two motor-cycles fitted with side-carriages; a motor-cycle, minus wheels and saddle, with sections cut away to expose the working parts; and a number of separate parts. The side-carriages, which are very popular in England, were shown here for the first time. One was convertible from a light delivery box to a single-seat for a passenger, the change being effected by folding the seat over the footboard. The back and sides of the seat completely enclosed the footboard space, forming, with the space in the back, reached through a lid, a roomy receptacle for light packages. The other side-carriage was a purely passenger affair, made of basket-work, comfortably upholstered and hung on springs.

Autocar Equipment Co., Chicago, Ill.—Continental motors, with two and four cylinders, were exhibited here. In making the castings for these motors French practice is followed, metal flasks being used and the molten metal placed under heavy pressure so that the grain is made close and susceptible of a high finish, and flaws and blow-holes are avoided. Every part of the motor is as accessible as the manufacturers can make it, case of getting at a given part being a strong point. The valves are all mechanically operated and are all on the same side. A three-speed sliding gear transmission was shown in connection with a 4-cylinder motor; also cylinder castings with sections cut out to show the quality of the work.

Autocoil Co., Jersey City, N. J.—This exhibit was made up of samples of a very extensive line of ignition coils of all sizes and styles, suitable for any system of ignition in which a coil is employed.

Brown & Sharpe Mfg. Co., Providence, R. I.—Special gears, hardened and ground, were exhibited at the Brown & Sharpe stand, and a complete sliding gear transmission and equalizing gear were shown running from an electric motor. Hand wheels were attached to the ends of the differential shafts so that by holding one or the other stationary, the operation of the differential gearing would be shown. A special spiral steering gear was fitted with a hand wheel for operating it. Finished cylinder castings were exhibited with sections cut out to show the interior finish and the accuracy of the coring, and finished pistons and rings and a gear circulating pump completed the exhibit.

Byrne, Kingston & Co., Kokomo, Ind.—A complete line of Kingston carbureters is shown by this concern, as well as steering wheels, mufflers—plain and fitted with cut-outs—and electrical ignition apparatus. A novelty in steering wheels is one with a hard rubber rim vulcanized to the brass spider and highly polished. French practice is followed in the winding of the ignition coils which, with an extensive line of ignition apparatus not exhibited, forms a new departure for this concern.

S. F. Bowser & Co., Inc., Fort Wayne, Ind.—Gasoline storage systems were exhibited in great variety by this concern, which makes a specialty of such apparatus. Several sizes of cabinets were shown, as well as tanks, for surface and underground use, long-distance pumping systems, gasoline force pumps and automatic measuring pumps. The self-measuring pump is operated by a crank, which is turned as far as it will go in one direction, and then turned the opposite way, when the gasoline is delivered through a faucet. By setting a hand on a dial the quantity pumped per stroke may be regulated exactly, and the regulating stops are adjustable so that great accuracy in measuring is possible. A lock and key are provided for securing the apparatus against unauthorized use, and a meter shows the total quantity of fluid passed through the pump as a check on the amount consumed.

Carlyle Johnson Machine Co., Hartford, Conn.—Marine reverse gears and friction gears were shown on this stand, one of the former being shown in actual operation

connected to a propeller running in a glass tank of water, an electric motor serving to rotate the shaft. Several sizes of plain friction clutches are also exhibited, together with separate parts showing the method of construction. A feature of the reverse gear is that it requires but little space below the shaft in the bottom of the boat.

Cleveland Car Specialty Co., Cleveland, O.—A complete automobile frame of pressed steel is shown by this firm; also several separate frame members of pressed steel.

Consolidated Mfg. Co., Toledo, O.—The Yale-California motor bicycle exhibited by this concern has a 2-horsepower air-cooled motor fixed with its cylinder parallel to the lower tube of the frame. The machine has several peculiarities, being fited with an outside fly-wheel, a surface carbureter, belt drive with leather-covered pulleys, spring forks and spring handle-bars. The weight is 110 pounds.

Detroit Steel Products Co., Detroit.—This concern makes a specialty of automobile springs, and exhibited a number of well-finished specimens of the types supplied for Packard, Cadillac, Oldsmobile, Thomas and Northern cars. One particularly heavy spring shown was a transverse front spring as used on the new Packard car, having ten leaves, 2 1-2 inches wide.

Federal Mfg. Co., Elyria, O.—This was a large exhibit, one of the main features of which was a complete chassis, handsomely finished, with 4-cylinder motor and sliding gear transmission and bevel gear and shaft drive. An interesting power outfit was a complete Westinghouse electric motor set for a heavy truck, consisting of two iron-clad motors with chain drive and operating mechanism, the gearing and accessories being manufactured by the exhibitors. A massive wheel steering gear suitable for a truck of the same size as that for which the motors were designed was set up in working order. The remainder of the exhibit consisted of a sliding-gear transmission; heavy front and rear axles, the latter with bevel gear drive; steel hubs; ball bearings; wheel steering gears for touring cars; a show case of driving chains of all sizes and a similar case containing steel balls from the size of a pin-head to 3 inches in diameter.

KING DODO HORN WITH PLUNGER TO BE WORKED BY THE FOOT.

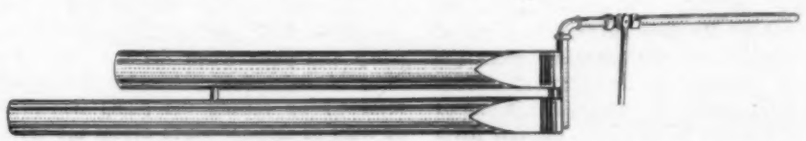
C. C. Gunther's Sons, New York City.—The exhibit at this stand comprises a large variety of fur and leather clothing for automobilists, both men and women, some very handsome fur coats being particularly noticeable. Among the useful articles shown were fur-lined boots, fur boots with extension legs reaching to the hips, and soft leather boots made in the same way.

Hess-Bright Mfg. Co., Philadelphia.—Ball bearings for automobiles and other machines were the main exhibit of this firm, the bearings being of what is usually called the Mercedes type, consisting of two concentric rings with the balls in the space between them running in grooves in the rings. A small gate in the inner ring, at a point where there is no load, permits the removal of the balls. A complete transmission and differential gear from a Smith & Mabley simplex car was shown with ball bearings throughout; also a large ball-bearing electric motor running at high speed with great smoothness. A smaller motor was placed on a stand and means provided for turning the shaft to show the absence of friction. As an indication of the durability of these bearings, a set of balls was shown that was credited with a record of 60,000 miles in a 40-horsepower Mercedes car. Though there is no means of adjustment, there was a barely perceptible amount of play radially, and no unevenness in the grooves or balls. Ball bearings in wheels and separate hubs and separate bearings and parts completed this exhibit.

Imperial Wheel Co., Flint, Mich.—Several sizes of wood artillery wheels were exhibited, all "in the white," to show the wood and the joining, fitted with various kinds of rims and hubs. Wheels were shown as supplied for the Oldsmobile, the Cadillac, the Packard cars, as well as special styles, with straight and with swelled spokes.

Jersey Brake Co., Newark, N. J.—Searls folding automobile jacks in all sizes were exhibited at the stand of the Jersey Brake Co. The construction of this device has been slightly changed in order to simplify its handling. Last season's Searls jacks required two movements to unfold them—one pull to separate the legs, and another to set them so that the weight would be properly carried. In the new models, the act of unfolding the jack sets the catch, so that it is necessary to give one pull only, when the jack is ready for use. It may, if desired, be used as a single leg jack by leaving it folded, its operation being the same in either case. Jacks were shown lifting against a scale which showed their capacity and the muscular effort required to operate them.

Manufacturers' Foundry Co., Waterbury, Ct.—Fine castings of a complicated character are the specialty of this firm, which showed a dozen cylinder castings for air and water cooling, split, showing the uniformity of thickness in the walls and the freedom of the metal from flaws and blow-holes. These castings were noticeable from their smooth surfaces, both inside and out. Piston castings and a few air-cooled cylinder heads formed the remainder of the exhibit.



GABRIEL CHIME HORN FOR CONNECTION WITH EXHAUST PIPE OF GASOLINE CAR.

McGiehan Odometer & Mfg. Co., New York.—This exhibit comprised a number of McGiehan odometers mounted on a stand and kept in motion by an electric motor. These instruments are operated, when attached to automobiles, by a flexible shaft rotated by a gear on the road-wheel hub. The styles made comprise a trip instrument, which may be set back to zero at the end of a run; a total mileage instrument, which continues to register up to the limit of its capacity, and a combination instrument, embodying both these features in one odometer.

Motsinger Device Mrg. Co., Pendleton, Ind.—Several Auto-sparkers are exhibited in operation, driven from the rim of a large wheel, the terminals of the generators being attached to sets of spark plugs. The features of merit particularly emphasized are the constant speed of the machine, obtained through the use of a special governor, and its durability, the bearings being long and solid and the parts generally of substantial construction.

National Car Wheel Co., Rochester, N. Y.—Castings of aluminum, bronze and iron were shown at this stand, the aluminum castings being particularly noticeable. These consisted of crank-cases for 4-cylinder motors, pipe elbows, pump shells, transmission gear cases and bevel driving gear case. Some samples of small bronze castings were also shown, as well as an iron casting for an air-cooled cylinder head.

New York Coach & Auto Lamp Co., New York.—The special feature of this ex-

hibit was an acetylene searchlight, fitted with a focussing device, by means of which the light can be diffused and softened for use in the city, where the blinding glare of the searchlight is objectionable, and brought back to a sharp, far-reaching pencil for country roads. This is accomplished by moving the burner nearer to or farther from the reflector. The remainder of the exhibit consisted of automobile lamps, gas and oil, for every use about the car, the low-priced lamp for the low-priced runabout not being forgotten. Searchlights were shown fitted with ordinary reflectors and with lens mirrors.

Oliver Mfg. Co., Chicago.—This exhibit consisted of Peerless automobile jacks of all sizes, suitable for anything, from the lightest runabout to the heaviest electric truck. Simplicity of construction is one of the good points of this jack, the few parts being substantial and not liable to breakage, and the whole being free from complications.

Pennsylvania Rubber Co., Jeanette, Pa.—The pneumatic tires exhibited by this concern are stated to be made exactly like the French Michelin tires in every respect, the manufacturers even going to the extent of employing workmen who have had experience in foreign tire factories and who understand French methods. A number of sizes of clincher tires were shown, as well as leather-covered and studded tread tires for winter use.

A. O. Smith Co., Milwaukee, Wis.—This exhibit comprised a variety of pressed steel frame members, both longitudinal and transverse, some heavy, for large cars, some of moderate weight, and some of great lightness; a complete frame, with springs in place; several sets of axles, front and rear, the former in the dropped and straight shapes, all with Lemoine pivots, and the latter of the live type, with bevel-gear drive and either spur or bevel differential gears; all fitted with ball bearings of the Mercedes type; separate hubs; differential and transmission gears; hubs, steering gears and a great variety of small parts.

Steel Ball Co., Chicago.—An automobile dashboard is shown fitted with two Hill Precision Oilers, run from a motor to exhibit their operation, the ends of feed pipes being left open. Glass sight-feeds show the rate of feed, which may be varied at will, the amount fed being proportioned to the speed of the motor at all times. In addition to the lubricators shown in motion, there was an exhibit of a number of sizes separately, with pulley, sprocket and ratchet drive, having from two to ten feeds.

Swinehart Clincher Tire & Rubber Co., Akron, O.—Several sizes of Swinehart solid tires are shown at this stand fitted to standard rims. Two of these tires, mounted on wheels, are placed under hand levers fitted with knobs which bear on the rubber. The compression of the rubber which follows pressure on the lever gives an idea of the resiliency of the tire and its capacity for "swallowing" small obstructions in the road. A Swinehart tire is shown on a rim which is badly broken and bent, the tire, however, being uninjured.

Tokheim Mfg. Co., Cedar Rapids, Ia.—A working model on a small scale, and also a full sized Dome gasoline pumping outfit are shown in operation, pumping water, however, instead of gasoline. The gasoline is pumped into a graduated glass dome, and then released and run through a hose into the automobile tank. Water or sediment may be seen through the glass and kept out of the tank, and what remains in the pump and pipes when the tank has been filled is allowed to return to the supply reservoir by raising the pump handle to its limit of motion, which causes the valves to open a clear way and allow all gasoline to drain back. The same apparatus is shown without the graduated glass dome, pumping a specific quantity per stroke of the pump. Parts of the outfit are shown separately.

Warner Instrument Co., Beloit, Wis.—An electric motor operates a number of the magnetic speed indicators of the Warner company, a variable speed gear being fitted so that the instruments will indicate various speeds. An assortment of indicators is shown in a glass case. There is also shown a cut meter, this being an instrument made on the same principle as the speed indicator, for measuring peripheral speeds in lathe work, or horizontal speeds in planer work, so the cutting speed may be properly gauged. A revolving cone provides a means for operating the cut meter at different velocities.

Webb Co., New York.—The Webb company showed a number of its new air-operated speed recording instruments, one being driven by a small electric motor. In the Webb instrument the indicating needle moves up and down in a graduated glass tube, being raised by a current of air set in motion by a diminutive gear pump worked from the road wheel of the car. The instrument was exhibited for the first time and attracted considerable attention.

Wheeler Mfg. Co., Detroit.—This concern exhibited a variety of cape tops for automobiles of various sizes, having from three to five bows, according to size and design, and one being shown fitted with a glass front. Hampers for side and rear attachment, umbrella baskets, brass railings and trimmings and steering wheels in considerable variety of finishes comprised the remainder of this exhibit.

Wray Pump & Register Co., Rochester, N. Y.—This exhibit consisted of Kellogg compound tire pumps, plain and with extra powerful gearing, air gauges, tire valve connections, gasoline purifiers or filters and a pneumatic jack. This last is essentially a pneumatic ram, with a ratchet device to prevent its falling back, and is operated by a regular Kellogg compound pump. A gauge connected with the jack showed a lifting power of 1,500 pounds with comparatively slight exertion on the part of the operator. The load may be gently lowered by opening an air escape valve, or the ratchet will hold it up as long as desired. The gasoline purifier has a chamois strainer and a trap for water and sediment.

In the Balcony and First Tier Boxes.

INTEREST was high at this great show literally as well as figuratively speaking, for visitors in the thousands each day climbed the two flights of stairs from the main floor of the big amphitheatre to see the sixty odd exhibits that crowded the balcony and the second tier boxes. Here, close under the big steel girders that reach out their long arms to the arch of the great roof was a better display of automobile sundries and specialties than was ever shown at any previous show in America, notwithstanding that it was but the overflow from the arena platform (the first balcony), and the first tier and central boxes.

Commencing on the south, or Twenty-fifth street side, and at the west, or Madison avenue end, the numbers of these exhibits ran around from No. 1 to No. 42 without a skip; and there were twenty-five spaces in the row of second tier boxes, and half as many more in the balcony extension at the other end of the building. Though crowded out to the very rim of the show, so to speak, these second balcony exhibitors were not to be overlooked. On coming in upon the main floor from the street the visitor was greeted with the hoot, the honk and the long-drawn raucous bray of many auto horns, hurled down from under the rafters, dulcet calls upon his time and good nature, and as often proved the case, upon his pocket-book; for there was something back of the call every time. The man who exhibited metal polish under the rafters was as attentive and earnest, as generous with his time and conversation, as the agent for the most expensive car on the main floor, the agent for imported tires as genial as the man who solicited orders for five-ton beer trucks.

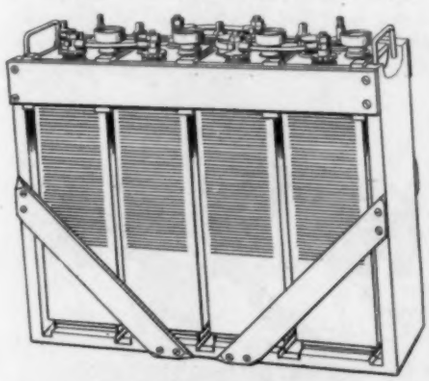
The various displays in this section included the following:

The Auto Supply Co., New York.—An attractive display of automobile sundries; genuine Alpha lamps; a sliding gear transmission for single or double chain drive; the "P. T. C." power tire pump, operated by a friction pulley engaging with the flywheel of the motor—a handy, serviceable tool, easily attached to any car and guaranteed to give pressure up to 300 pounds. A nicely arranged exhibit and well attended.

Breeze Motor Mfg. Co., Newark, N. J.—

The "Tourist" motor cycle; a 3 horsepower flat belt drive machine with the engine suspended in the loop of the frame, the crank-case equi-distant between, and a trifle below the line of, the axles of the front and rear wheels and the cylinder tilted forward in line with and just above the diagonal tube of the frame. Forks extend to handle bar; wheel-base 56 in.; ignition batteries and coil and gasoline tank stored in a large case suspended from cross tube of frame; weight about 160 pounds. Has every appearance of a good road machine.

W. H. Brown, Chicago, Ill.—The well known automatic dust deflecting guards for tonneau bodies of touring cars. All motorists who passed his exhibit were interested, and he complained of having to



EDISON STORAGE BATTERY.

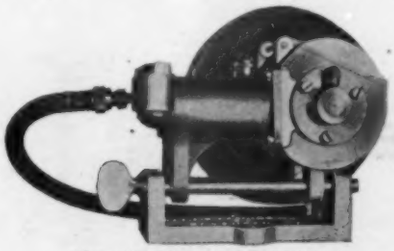
stand up so much to exhibit his invention. Everyone thought it a simple arrangement and wondered why no one had thought of it before.

The Concentrated Acetylene Co., Indianapolis, Ind.—"Prest-O-Lite" gas tanks, for automobiles, launches, camps. A portable tank of convenient size and shape, charged with gas, to replace the acetylene generator. The user to exchange the empty tank for another charged with gas. A device which should find most favor in cities where the manufacturer has an agent.

Continental Caoutchouc Co., Emil Grossman, Agt., New York.—"Continental" double-tube tires, made in Hanover, Germany. That these celebrated tires have many admirers in this country was evidenced by the steady attendance at the exhibit. The attendants were kept busy showing the newest tools and appliances for repairing punctures and handing out printed matter. A busy stenographer at one end of the booth implied business, but she may have been writing "follow-up" letters.

Dr. T. J. Cooper, Paterson, N. J.—The "Fear-Naught" punctureless and non-collapsible pneumatic tire, made in two styles—with and without lugs. The style with lugs to replace old style single-tube pneumatic tires; that without lugs to be set in a steel rim having numerous square projections to engage in corresponding square openings in the central rubber core of the tire, thus preventing creeping.

G. H. Curtiss Mfg. Co., Hammondsport, N. Y.—"Curtiss" double-cylinder and single-cylinder motor cycles and motors. Double cylinder machine is rated at 5 b. h. p. at 1,800 r. p. m., and has its engine slung in the



P. T. C. POWER TIRE PUMP.
Driven by Friction, Pulley Bearing Against Engine Fly Wheel.

loop of the frame, the cylinders inclining respectively forward and back at about 60 degrees. The single-cylinder machine has its 2 1-2 horsepower engine mounted vertically, equi-distant between the wheels. Both machines are driven by a flat belt, and the wheel-base of each is 58 inches. Similar to 1904 models.

Demmerle & Co., New York.—A very complete line of clothing for automobilists, including fur and leather, great coats for men and women, full leather suits, hats, caps, leggings, gloves, masks, and goggles of every description. The cut of the Demmerle clothing stamps it as high grade, yet it is suitable alike for owner or chauffeur. A charming blonde, very young and very shy, attracted much complimentary com-

"ECCO" LOCK SWITCH WITH REMOVABLE HANDLE.

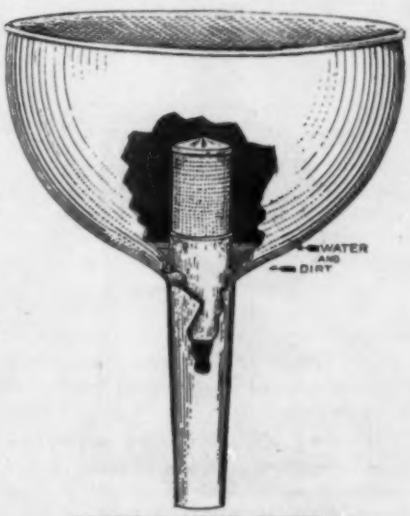
ment from sundry bald-headed masculine visitors; in vain they bowed and smiled, for she was just a modest little "dummy."

Eastern Carbon Works, Jersey City, N. J.—A line of "Eastern" dry batteries for motor cycles, automobiles and motor launches; electric pocket flash lights and hand torches. The Champion three-speed and reverse transmission gear, made by the Champion Mfg. Co., Newark, N. J., was also exhibited at this booth; a simple and strongly constructed sliding gear of convenient size and light weight.

Edison Storage Battery.—This much advertised invention, which has promised so much in the past three years, is merely represented at the show by the case of parts and cells and a complete nest of batteries seen in previous years, and more recently exhibited at St. Louis.

Electric Contract Co., New York.—A nice array of dry batteries and electrical novelties, including "E. R. G." dry cells and batteries, "Ecco" dry cells, "Williams" spark coils, automobile gauge-glass lamps, electric flash torches and cable terminals. The electrical novelties gave this exhibit somewhat of a "cut glass" appearance, and the passer-by who paused to look at the pretty things was taken in tow by the man with the order book.

The English & Mersick Co., New Haven, Conn.—Automobile fixtures and tops. An



BREEZE GASOLINE FUNNEL.
Note Two Strainers and Trap for Water and Dirt

exhibit having the stamp of quality, and not over-crowded, giving the interested caller opportunity to see and understand. Automobile builders were most in evidence at this stand, and the conversation savored of business on the wing.

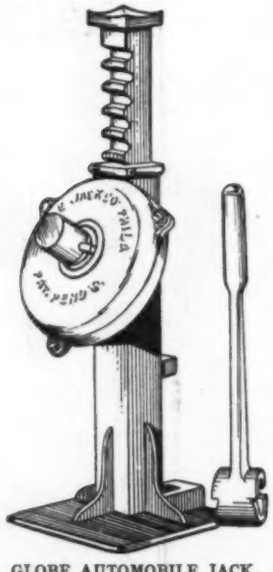
A. H. Funke, New York.—"Autolyte" acetylene gas lamps and generators; imported horns, goggles and spark plugs, air-gap terminals. The lamps were the feature of this exhibit, and Mr. Funke was there to clinch the large orders. He busied himself with many out-of-town jobbers and retailers, however, rather than with owners of cars. He said that it was much the best show he had ever attended.

Hendee Mfg. Co., Springfield, Mass.—"Indian" motor cycle, equipped with Hedstrom motor and carbureter, the same as for the past three years. Chain drive machine of 1 3-4 horsepower with engine displacing seat mast of frame. This machine won the highest award at the Louisiana Purchase Exposition. Improvements on 1904 model are throttle control with left grip and new "Indian" cushion fork, patented Jan. 10, 1905. A thoroughly fit and trim machine.

Wm. Hjorth & Co., Jamestown, N. Y.—"Lightning" combination wrench and plier,

and the "Empire" pipe wrench. The former tool attracted much attention, and very many of them were sold on the spot. It is a perfect pipe and nut wrench combined, taking a pipe or a nut of any shape without adjustment; also a wire cutter, screw driver and nail puller. The "Empire" is a very quickly adjusting wrench, but meant for heavier work than the "Lightning."

T. P. Howell & Company.—Like many other old companies, this one, the oldest in the carriage leather business, has found a new and far wider field through the automobile. It is now making every grade of leather with the high finish demanded for



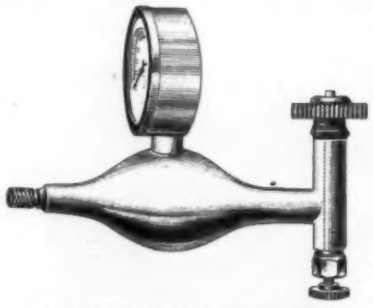
GLOBE AUTOMOBILE JACK.
Has Rack and Worm Movement, Locking in Any Position.

automobile work, samples of different colors and finishes being shown.

International Auto & Vehicle Tire Co.—The Fox brand of tires are shown by this company in a variety of styles and sizes for light and heavy vehicles. One of the 4 1-2 inch tires is shown in position on a wheel mounted horizontally on an automobile axle set vertically.

The Lunkenheimer Co., Cincinnati, O.—Lubricating specialties of all kinds. "Senior," "Junior," "Joker," "Graphite," "Banner," "Major" and "Paragon" sight feed lubricators; hand oil pumps, grease cups and oiling devices of all kinds. This manufacturer's well known line attracted many small manufacturers, or, more correctly speaking, builders. Jobbers, retailers and owners of cars were likewise business callers.

C. H. Metz, Waltham, Mass.—"Metz" chain driven motor cycle, equipped with the well known "Thor" motor and carbureter. Engine is mounted vertically, equi-distant between the axles of the wheels. Frame is reinforced by an additional cross tube, and between that and the main cross tube the cylindrical gasoline tank and lubricating oil tank is suspended. Transmission is by chain direct from engine pulley to large



NATIONAL PRESSURE REGISTER.
Indicates Air Pressure When Pumping Tire, Resulting in Uniform Inflation.

sprocket of "Thor" compensating and yielding disc drive on the rear wheel.

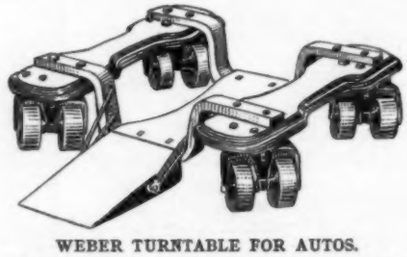
Charles E. Miller, New York.—This booth held the overflow from Mr. Miller's other exhibit on the balcony below and at the east end of the building. The "Leavitt" ball contact ignition timer; "Dodge" positive lubricators; "Globe" automobile jacks; "R. & C." magnetic liquid indicators for gasoline tanks; "I-C" leather tire tread, and various specialties, all worthy of attention. The "Dodge" lubricator and the "Leavitt" contact timer attracted the most attention.

Motor Car Equipment Co., New York.—Successors to Emil Grossman as agents for "Bougie B." and "E. G." spark plugs, F. Berton & Cie. auto horns, E. Sclaverand oiling devices, G. Dalsacse "Le Radium" lamps, "Republic" non-slip tires and "Continental" lamps. Also agents for "Weber's" portable turntable, W. A. Russell & Co. induction coils, and "Shaw" and "B. B." jacks. A complete line of French goggles and various automobile specialties. A well attended exhibit.

Pneumatic Tire Protector Co., Dayton, O.—"Life Preservers" for automobile tires of all sizes. A detachable heavy rubber cover, to be secured to the tire by twelve strong metal clamps which are adjusted with a wrench. A very serviceable looking device, though to the casual observer it appeared as requiring some time and patience to attach. The demonstrator was pleasingly attentive in convincing one to the contrary.

The Post & Lester Co., Hartford, Conn.—Here the visitor was handed a large envelope containing some twenty odd pieces of advertising literature, for this concern sells automobile, motor launch and motor cycle parts, supplies, sundries and specialties of every description. They featured a new Volier "Dragon" auto horn, and a very cleverly designed dash clock.

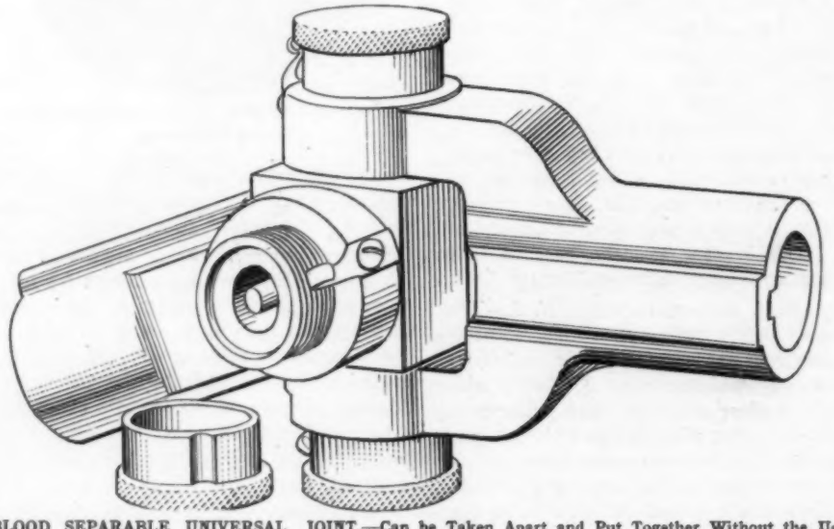
Wm. Roche, New York.—Automobile, motor boat and motor cycle ignition supplies and appliances. This exhibitor was not doing "missionary work," he was doing



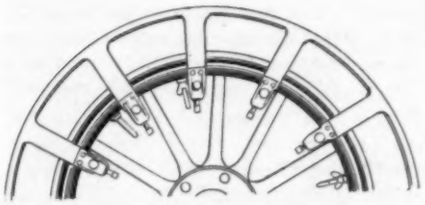
WEBER TURNTABLE FOR AUTOS.
The Wheels of a Car are Rolled Into These Little Trucks Which Permit Car to be Turned in its Own Length.

business. If you had no automobile, no motor boat, no motor cycle, no electric alarm clock, you must surely have an electric door bell. The retailer, the jobber and the manufacturer all gave toll, and every passer-by was reminded not to forget Wm. Roche when in need of batteries, coils or plugs.

Rushmore Dynamo Works, Plainfield, N. J.—A very taking display of the "Rush-

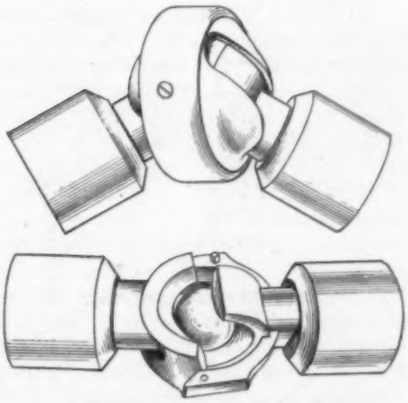


BLOOD SEPARABLE UNIVERSAL JOINT.—Can be Taken Apart and Put Together Without the Use of Any Tools.



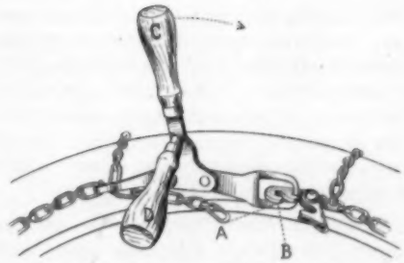
PNEUMATIC TIRE PROTECTOR

Made of Tough Rubber Tire Tread and Canvas Fabric, with Clamps Fastening to Rim of Wheel.



LEHMAN UNIVERSAL JOINT.

Assembled Showing Retaining Band, and with Band Removed to Show Construction.



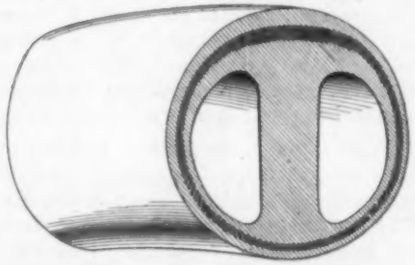
WEED'S CHAIN TIRE GRIP TOOL.

A. and B. Show Ends of Detachable Chain Anti-Skidding Tire Grip and C and C Handles of Special Tool for Bringing Chain Ends Together.

PERSPECTIVE OF TIRE PROTECTOR.

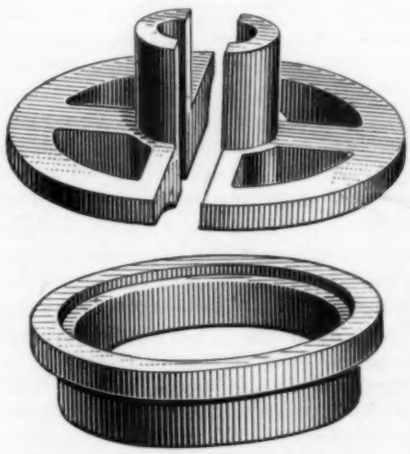
VOSBURGH REPAIR PLUG.

Stem is Drawn Through Puncture and Brass Washer is Pushed Down Firmly Against Tire, Where it is Held by Expansion of the Rubber Stem.

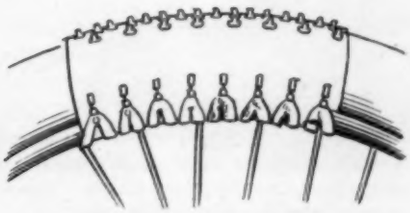


COOPER PUNCTURE PROOF TIRE.

For Use with Special Rims or Made with Lugs Embedded in Central Rubber Core for Attachment to Ordinary Rims.

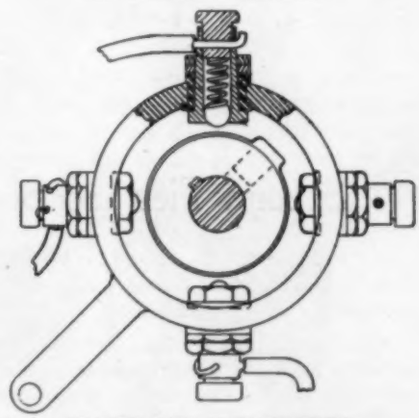


MORGAN DIVIDED SPIDER AND CAGE.



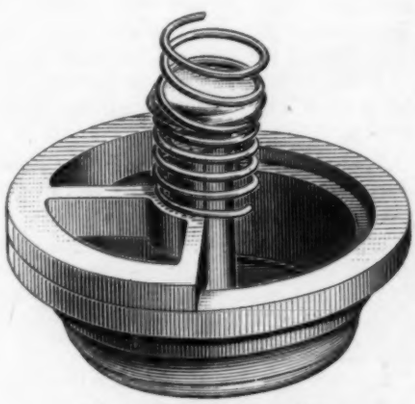
WALKOVER TIRE SLEEVE.

Made of Rawhide, with Rivets on Tread and Hooks for Strapping Around Rim.



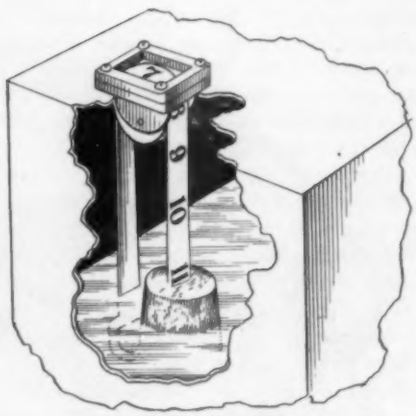
LEAVITT BALL CONTACT TIMER.

Note the Stationary Contacts Fitted with Balls held Out by Springs, as Shown in Upper Section.



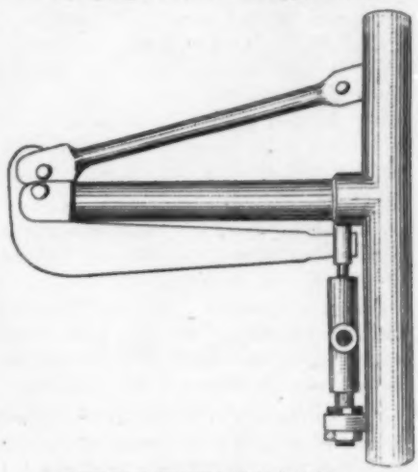
MORGAN VALVE AND CAGE.

Split Guide for Valve Stem Permits Using Mushroom End on Stem Instead of Cotter to Retain Spring.



BLOOD GASOLINE GAUGE.

Brass Oil Tight Frame Protects Tape, Which Can Be Marked in Inches on Gallons.



OFELDT'S WATER REGULATOR.

An Automatic Thermostatic Device to Replace Gauge Glasses on Steam Cars. Expansion and Contraction of Central Horizontal Tube Opens or Closes by Pass.

more" acetylene gas searchlights and generators. It was noteworthy that there was a goodly attendance of motor boat owners at this exhibit. One or two particularly fine lamps attracted the attention of even the casual passer-by. Everything shown had a wear-and-tear, business look, which augured well for future sales.

Scoville & Peck Co., New Haven.—The variety of oil and acetylene lamps and searchlights for automobiles made by this company are described and illustrated in a folder-booklet of novel form, and the lamps themselves are shown, with generators. The leading feature of the exhibit is naturally the big Peck automatic gas headlight of French pattern. Next to this in size is the Peck pilot searchlight with 7-inch reflector with solid silver face.

Trebert Auto & Marine Motor Co., Rochester, N. Y.—Four-cylinder vertical engines for automobiles or motor launches. The automobile engine was rated at 34 b. h.p. at 900 r. p. m.; dimensions of cylinders 4 1-2 by 5 inches; total weight ten pounds per horsepower; dimensions over all; length, 30 in., width of engine 13 in.; width over all, including flywheel, 16 in.; height from center of shaft to extreme top, 21 in. Mechanically operated valves. A compact, well-balanced, business-like engine suitable to replace engines of insufficient power in cars of medium weight.

The United Electrical Mfg. Co., New York.—"Lipman" rotary pumps and automatic carbureters; "Crescent" round and square dry batteries and "Crescent" spark plugs. An exhibit which drew business as well as attention. Visitors showed interest in the pumps and carbureters and the demonstrator fostered the merest flicker into a real flame.

Vacuum Oil Company, New York.—This company, with its multitude of other special products, has met the new demand with a line of automobile lubricants under the name of Mobiloil in special grades for both steam and gasoline machines. Different grades are made in each class, according to the speed and nature of the motor. An automobile wheel, journaled and run by an electric motor, is fitted to give a practical test of the oils

Orlando W. Young.—This is a new exhibit of an old firm, Young's oils being known to users of engines and machinery for twenty-five years. The new demand for automobile lubricants is recent years has been met by the production of a very large line, shown this year for the first time. In addition to various grades of the finer oils there are shown the heavier lubricants for gear cases and cups, with and without graphite. For cleaning there are metal polishes of different kinds, automobile waste, and a special preparation of automobile and axle soap for removing grease from cars.

Second Tier and Second Balcony Exhibits.

H. A. Allers & Co., New York.—The Solarine metal polish, a fluid for cleaning all kinds of metal, is exhibited.

American Lubricator Co., Detroit.—Lubricators for steam, gas or gasoline engines and attachable automatic oiling devices are shown in considerable variety.

L. Anguilli, New York.—The feature of this exhibit is the helmet automobile lamp, which may be used either as a headlight or a sidelight. It is made in the exact pattern of a Roman helmet, the visor dropping down and forming a hood in front of the lens. Another unique model is a searchlight made in the shape of a ship bell. More conventional designs are shown in wide variety.

Atwater-Kent Mfg. Co., Philadelphia.—Kent pocket meters, switches and coils are shown.

Chicago Pneumatic Tool Co., Chicago.—Drills, both electric and pneumatic, automobile speed recorders and indicators and storage batteries are exhibited.

Constant Spark Plug Co., Boston.—A double, reversible, self-cleaning spark plug, for which many advantages are claimed, is shown here. The plug has two identical ends, either of which may be used alone at will, or the two together, giving twice the wearing life of the ordinary ignition plug.

Adam Cook's Sons & Co., New York.—Albany Grease, a solid lubricating compound for automobiles, made in seven different grades of hardness, is shown.

W. D. Custead, New York.—The Custead variable speed and power transmission for automobiles, motorcycles, bicycles, boats, launches, and in fact for all purposes where transmission of power at variable speed and change of direction is required from the uniform source of power, is exhibited. It is claimed for this device that it gives any speed and power desired in either direction up to the limit of power applied, regardless of the speed or direction in which the motor is run. The speed and reverse are each controlled by a single lever, and it is impossible to reverse the driven shaft until the lever is reversed. When placed on an automobile, it is not necessary to use different gears in and out to change the speed, nor in fact to have any equalized or differential gears, nor is it necessary to put the brake on when stopping while going up a hill, because when the lever is reversed the carriage locks itself, and no reverse motion is possible. In climbing a hill the engine may be permitted to run at its full speed, and the speed of the vehicle governed exactly according to the grade and the power of the motor.

Duff Manufacturing Co., Pittsburg.—The well-known Barrett automobile jacks are shown by this company.

Gabriel Horn Mfg. Co., Cleveland.—A new horn for automobiles and launches, consisting of one or more brass tubes, a combination of more than one producing a chime, is shown. These horns are blown from the exhaust of the engine, thus doing away with the necessity for the use of the air compressing device. The four-cylinder vertical gasoline engine made by the Brew-Hatcher Co., of Cleveland, O., is also exhibited in this space.

Hartford Suspension Co., New York.—The Truffault Hartford suspension shock absorbing device, to be placed between the springs of any spring vehicle, is exhibited. It is claimed for this device that a jolting motion of the body is absolutely prevented, and the car will ride smoothly, no matter how violently the wheels may jump.

Ironclad Mfg. Co., Brooklyn.—Ironclad steel barrels and drums for the storage and transportation of oil and gasoline, and an ironclad automobile gasoline storage tank, to be buried in the ground, are shown.

W. J. Kells Mfg. Co., Jersey City.—Honeycomb water coolers, disc radiators, gasoline and water tanks, aluminum dashboards, mud guards, mufflers, fans and other automobile parts of this nature are exhibited in large variety.

Klean-al Manufacturing Co., New York.—A patent preparation for removing grease or grime from the hands, and for which many advantages are claimed, is exhibited.

Charles F. Lighthouse & Co., New York.—This firm, which is a large manufacturer of leather and metal novelties, shows automobile licensce tags in a large variety.

McCord & Co., Chicago.—Forced feed lubricators, the Hibbard Automatic Tire Pump, the McKim copper, asbestos gaskets and copper hardened genuine Babbett metal used, the McKenna circulating pump are included in this exhibit.

Merrill-Stevens Mfg. Co., Kalamazoo, Mich.—An automatic jack for automobiles, with a compound lever, double acting, which operates on both strokes, both upward and downward, is shown in a number of models. A feature of the device is the drop of the handle of the lever, which protects the hands from injury against the frame of the vehicle.

H. & F. Mesinger Mfg. Co., New York.—The Mesinger detachable tire protector is exhibited by this firm.

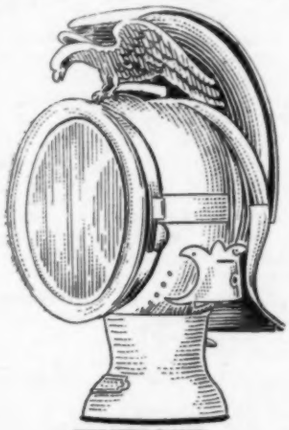
E. B. Meyrowitz, New York.—Automobile goggles, pocket lamps, ammeters, pole indicators, volt meters, field glasses, cameras and other optical and electrical devices are shown.

Myers & Alexander, New York.—Automobile baskets and hampers of several varieties are exhibited, chief among which is the "ever dry" basket, which is not only

water and dust proof, but has a smooth surface, so that dust will not adhere to it. The hose may be turned on it and it may be washed with the car.

New York Sporting Goods Co.—A wide variety of automobile attachments and accessories, including lamps, horns, spark plugs, tire protectors, dashboards, clocks, goggles oil and grease guns, volt meters, ammeters, license tags is exhibited.

F. W. Oldfeldt & Sons, Brooklyn.—An automatic regulator for attachment to steam boilers, consisting of a stand pipe eight

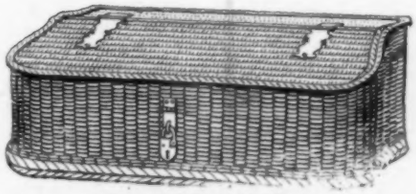


HELMET LAMP.
[One of the "Phare Angelicus" Models Shown by Anguilli.

inches high, which is attached to the boiler at top and bottom, a metal expansion tube at right angles to the stand pipe, and a lever operating a valve which is connected to the by-pass line is the principal feature of this exhibit. A water tube boiler of new construction, giving superheated steam, and which "cannot burn out," is also shown.

Pantasote Company, New York.—A patented substitute for leather and suitable for upholstering automobile bodies is shown, also mackintosh materials, for use in tops, curtains and covers. There is also a line of fancy silk cloth, with a pantasote backing, for use in limousine curtains. Automobile rugs made waterproof by a backing of the pantasote are also shown.

Parker Lock Switch, Newburg, N. Y.—A new lock switch for automobiles, made to



REAR TOURING BASKET.
Special Type for Side Entrance Cars Shown by Myers and Alexander.

operate with a key or combination lock, which enables the operator of the automobile to leave it standing in the streets without any danger of its being stolen or interfered with, is shown.

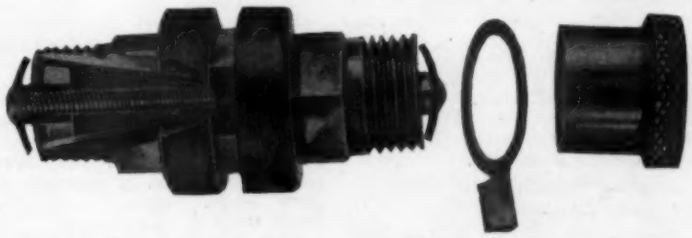
Patterson, Gottfried & Hunter, New York.—Metals, hardware, tools and supplies for the use of automobilists in general are shown. A specialty is made of the champion automobile repair kit, which contains enough tools to make any repair which can be managed away from the shop, and at the same time there is no superfluous weight. There are thirty separate tools in this kit. This firm is also the New York agent for and carries the New York stock of Brown & Sharpe gears, made by the Brown & Sharpe Mfg. Co., Providence, R. I.

Carl H. Pierce, New York.—The calculagraph, a time-measuring machine presenting the novel features of automatically computing and printing the elapsed time consumed in any operation, such as the repair of automobiles or the construction of machines of any sort is shown. A card containing three dial spaces is employed and is placed in the machine once at the commencement of the operation, which stamps it with the blank dials and the initial time. By placing the card in the machine a second time, when the operation is completed, it stamps it with the elapsed time.

Poly-Phase Ignition System Co., New York.—This company shows its system of high-tension ignition, consisting of an alternating current generator, one transformer induction coil without a vibrator, a positively operated contact breaker and a high tension current distributor conveying the high tension current to the spark plugs.

ARMORED SCREW DRIVER.
End of Handle Can be Used as Light Hammer. Shown by Patterson, Gottfried & Hunter.

Schwarz Wheel Co., Philadelphia.—Complete wooden wheels, spokes and rims for automobiles are shown. The spoke is a new form, with a mortise and tenon which has been patented by this company. The spokes are assembled without a hub, which is put on afterward. One of the principal features of this device is that the spokes are the same width in the center of the hub as they are at the outside, and it is impossible for them to come apart or become loose.



[CONSTANT DYNAMO CO.'S REVERSIBLE DOUBLE JUMP SPARK PLUG.

Edward Smith & Co., New York.—Varnishes for automobile bodies and running gears are shown by this concern.

Steam Carriage Boiler Co., Oswego, N. Y.—A flat-head steam boiler for automobiles, of new design, is exhibited, the principal feature of which is that the tubes are spaced 3-4 inch apart from center to center, making the distance between the outside edges of the tubes only 1-4 inch, by which the sheets or columns of water, as presented to the fire tube, are only 1-4 inch in thickness, giving great evaporation.

Charles O. Tingley & Co., Rahway, N. J.—A new tire patch composed of vulcanized and unvulcanized stock, which, it is said, vulcanizes while the tire is in use by the heat generated by the friction of the tire upon the road, is exhibited.

NEW STYLE COLLAPSIBLE "AUTOCLUB" GOGGLE SHOWN BY MEYROWITZ.

Valentine & Co., New York.—Furnishings for automobiles are shown applied upon specimen panels in a wide range and variety of color.

Utility Company, New York.—Motor car specialties in a large variety, chief of which are the Gre-solvent, for removing oil or grime from the hands, Utility plugs for ignition, battery switches, pigskin tire protectors and the rain aprons of the Automobile Equipment Co., of Detroit, for which this firm is eastern distributor, are shown.

In Attendance at Complete Vehicle Stands.

AT the complete vehicle stands were a great many men in the trade from the different parts of the country, who took advantage of the opportunity to fraternize during the annual show. Among those in attendance were the following:

Acme Motor Car Co.—John G. Horst, president; Arthur A. Develin, F. A. Develin, David L. Gate, I. D. Lengal, F. E. Moscovics, George H. Strout, John W. Mears and George Schwartz.

American Motor Co.—Townsend Marsh, Alonzo Hoyt and George P. Jenkins.

Apperson Brothers Automobile Co.—Edgar Apperson, L. A. Hopkins, G. M. Brown and C. L. Way.

Ardsley Motor Car Co.—W. S. Howard, J. Walsh and Mr. Fuller.

Austin Automobile Co.—Walter S. Austin, G. M. Tinken, George Adams and S. Blum.

Autocar Co.—Frank Eyeland, Marcus J. Brock, Wallace L. Hommedieu, L. S. Clark, John S. Clark, John C. Spiers and H. T. McComb.

Baker Motor Vehicle Co.—M. L. Goss, C. B. Rice, J. W. Harper and Karl Bostel.

Bartholomew Co.—O. Y. Bartholomew, treasurer; Ray Whitney, L. C. Wheeler and Edward Epperley.

Black Diamond Automobile Co.—Charles E. Turner, A. J. Seaton, E. A. Wadsworth, William Deiter, A. R. Lamberson, John F. Hyland, William H. Meharry, John Tallman, A. V. Brower, B. L. Tibbetts, Burton Bronaugh and A. G. Brower.

C. H. Blomstrom Motor Co.—N. M. Kaufman, president; C. H. Blomstrom, Benjamin Bradley and George F. Kehew.

James Brown Machine Co.—Merton H. Wheelock, J. Harold Johnson, Everett Cameron and S. D. Van Wagner.

H. H. Buffum Co.—H. H. Buffum and W. J. Howard.

Buick Motor Car Co.—W. C. Durant, D. D. Buick, Walter Marr, H. J. Keohler and J. H. Whiting.

Cadillac Automobile Co.—William E. Metzger, Elmer Pratt, George Grant, A. P. Brush, William Brush, and Messrs. Sweet, Craven, Youngblood, Krafve, Murphy and Bowen.

Cleveland Motor Car Co.—W. L. Colt and W. P. Culver.

Coldwell Lawn Mower Co.—H. T. Coldwell, A. W. Mapes, W. H. Coldwell and A. Young.

Corbin Motor Vehicle Co.—J. S. Bretz, F. H. Bogart, F. H. Allis and James W. Swann.

Covert Motor Vehicle Co.—B. V. Covert, W. C. Barry, Jr., Harold Hoag and Edward Fritton.

Crest Mfg. Co.—H. D. MacRitchie and H. W. Hall.

Daimler Mfg. Co.—C. M. Bouggy, E. R. Adams, A. H. Green and H. M. Wakeman.

De Dietrich Co.—R. E. Jarrige, Ch. Canaux, M. Moir and M. Ferro.

Detroit Auto. Mfg. Co.—W. H. Richmond.

John L. Dolson & Sons.—W. H. Vinald and G. E. Dolson.

Duryea Power Co.—Chas. E. Duryea, Walter Garside, Louis Lauther, Martin Newstetter and Marcus Rowe.

Eisenhuth Horseless Vehicle Co.—George T. Schull, J. Unser, B. F. Graham, F. B. Segardi, J. P. Quirk, F. B. Hyde and F. C. Carter.

Electric Vehicle Co.—M. J. Budlong, president; Jos. Joyce, Frank Armstrong, W. W. Burke, P. T. French, F. J. Fanning, Louis Ruprecht, A. B. Henley, F. B. Brand, George E. Risley, D. W. Henry, J. J. Gafney, Fred Dayton, G. W. Westby, W. J. McAnneeny, H. P. Maxim, Henry Core, H. Walden and Herman Cuntz.

Elmore Mfg. Co.—W. W. Gawthroup, J. H. Becker, B. A. Becker, T. M. Swane, R. G. Megargel, W. L. Poffenburger and W. W. Crawford.

Ford Motor Co.—Henry Ford, designer, John S. Gray, president; James Couzens, Charles Grant and Charles C. Meade.

H. H. Franklin Mfg. Co.—C. A. Benjamin, J. E. Bayliss, S. G. Chapman, A. M. Robinson, N. H. Dunbar, H. N. Thorpe and L. L. Whitman.

Gas Engine & Power Co. & Chas. L. Seabury Co. Cons.—John J. Amory, president; J. Hull Amory, Justin Walker and B. D. Gray.

Grout Bros. Auto. Co.—J. Gould, president; G. C. Cannon, Louis Grout and Charles Grout.

Haynes-Apperson Co.—Elwood Haynes, J. G. Gibson, E. V. Minich, R. R. Parker, F. E. Graves and E. T. Rose.

Jackson Automobile Co.—G. A. Matthews, E. F. Scheuffler and F. L. Holmes.

Thos. B. Jeffery & Co.—Thomas B. Jeffery, president; G. W. Bennett, slaes manager; A. W. Shattuck, C. E. Worster, Arthur Gardiner, W. J. Bowman, E. A. Gilmore S H. Baker, V. Neilsen, W. F. Smith and A. Coddington.

Kirk Mfg. Co.—Ezra E. Kirk and H. C. Tillotson.

Knox Automobile Co.—C. H. Cutler, president; W. E. Wright, vice-president; Robert H. Blake, M. Keeir, D. C. Fenner, C. E. Culver and Messrs. Springer, Dennison and Paddington.

Lane Motor Vehicle Co.—O. K. Raymond, J. T. Roosa and G. W. Lane.

Oscar Lear Automobile Co.—Oscar Lear, president; J. F. Stone, secretary-treasurer; L. A. Frayer and Isaac Howard.

Locomobile Co. of America.—S. T. Davis, Jr., president; A. L. Riker, J. A. Kingman, J. F. Plummer, Jr., A. W. Robinson, M. V. Dowd, K. M. Blake, A. S. Banta, R. A. Greene, B. G. Sykes, William Morgan, S. Bowman, J. H. MacAlman, S. B. Keim and R. S. Sheldon.

Logan Construction Co.—B. A. Gramm, vice-president; B. W. Twyman, Fred Bizantz and H. F. Sands.

Lozier Motor Co.—H. A. Lozier, Jr., E. R. Lozier, C. A. Emise, Samuel Regar, E. O. Durfee and J. W. Williams.

Mack Brothers Co.—J. M. Mack, A. F. Mack, W. C. Mack, D. McMeekan, Jr., and C. C. Mantle.

Marion Motor Car Co.—D. J. Hayden, Fred I. Stone, Frank Levey.

Matheson Motor Car Co.—C. W. Matheson, Charles R. Greuter, M.E., Horace L. Shepherd, Ralph B. Nettleton and Tom Cooper.

Maxwell-Briscoe Motor Co.—Benjamin Briscoe, president; J. D. Maxwell, P. Fremont Rocket, K. C. Pardee, R. F. Coburn, J. C. Walsh, W. R. Miller, F. S. Newcomb, Charles Pupki, A. M. Zimbrich and W. H. Webster.

Michigan Automobile Co.—F. D. Fuller and W. E. Russell.

Mitchell Motor Car Co.—G. B. Rogers, E. C. Byer, J. W. Bate and A. S. Robinson.

Model Gas Engine Works.—E. A. Myers, T. S. Casler and George Travers.

Napier Motor Co. of America.—Walter H. Woods and demonstrator.

National Motor Vehicle Co.—A. C. Newby, Thomas Hay, W. G. Wall, C. H. Tyler and W. G. Ribble.

Norman Motor Sleigh Co.—L. Norman, L. Nichols and C. S. Aldrich.

Northern Mfg. Co.—V. M. Gunderson, president; William T. Taylor, Chas. B. King, Peter Fogarty, Arthur Newton, Frank Chapin and A. T. Fuller.

Olds Motor Works.—F. L. Smith, Angus Smith, R. D. Chapin, S. S. Olds, W. E. Stokes, C. H. Larson, C. F. Gilmore, A. T. O'Connor, E. D. Trowbridge, H. T. Eisenburg, N. T. Harrington, Howard Coffin, G. S. Buck, W. B. Morley and James Brady, E. S. Anderson and C. B. Wilson.

Packard Motor Car Co.—H. B. Joy, S. D. Waldon, Charles Schmidt and W. R. Densmore.

Palais de l'Automobile.—H. C. Neubauer, manager; Henry C. Carter and E. L. Finn.

Panhard & Levassor.—A. Massenat, A. de Magnin, MM. Desvantery and Didrer.

Peerless Motor Car Co.—E. H. Parkhurst, L. H. Kittredge, L. P. Mooers, C. G. Wridgway, A. E. Morrison, K. C. Downing, J. Snow and L. J. Sackett.

Phelps Motor Vehicle Co.—L. J. Phelps, general manager; E. F. Phelps, S. H. Dingle, J. W. Walters, William Groeschel, G. M. Weatherby, James Baker and J. Roemmelt.

Geo. N. Pierce Co.—George N. Pierce, president; Charles Clifton, treasurer; Henry May, vice-president; D. Ferguson, Charles Shippy, F. A. Nickerson, E. C. Bull, W. H Ellis, Percy P. Pierce, Terrence Dey, A Lederman, Ed. Von Wertberg, J. A. Dowling and J. W. McGuire.

Pierce Engine Co.—A. J. Pierce, president; Frederick Pierce, Wallace Rouse, Francis Wise and William Reid.

Pope Mfg. Co.—Col. Albert A. Pope, president; Col. A. L. Pope, vice-president; A. H. A. Lienhard, foreign department; (Pope-Waverley Department), H. H. Rice, W. C. Johnson, O. B. Henderson, A. C. Downing, W. H. Jones and Henry Goodwyn; (Pope-Hartford Department, and Pope-Tribune), Charles E. Walker, W. C. Walker, Edward Dugan, R. A. Barkman, W. H. Keller, William Josey, C. S. Howard, F. L. Buckbee, F. C. Gilbert, W. J. Foss, C. R. Huff, Elliott Mason and Archie Hughes; (Pope-Toledo Department), H. S. Leyman, W. W. Bennett, R. V. Law, F. M. Keeton, A. S. Lee, J. T. Fisher, Carl Amos, C. H. Hough, R. H. Magoon, H. Fiske, R. Gamble, A. E. Schaff, W. Knipper, C. D. Weed and Earl Anthony.

Premier Motor Mfg. Co.—Frank L. Moore, George Wideley, Joseph Moore and E. Roger Stearns.

Prescott Auto Mfg. Co.—A. L. Prescott, G. E. Peacock, E. J. Foley and Q. H. Ball.

Pungs-Finch Auto. & Gas Engine Co.—E. B. Finch.

Reid Mfg. Co.—Harmon J. Hunt and Ralph J. Stone.

Reliance Motor Car Co.—F. R. Thrall,

G. A. Trout and W. K. Ackerman.

Reo Motor Car Co.—R. M. Owen, L. E. Howell, F. W. Stockbridge, Richard Lockwood, L. E. French, C. B. Sterling, S. M. Smith and C. E. Easter.

Royal Motor Car Co.—E. D. Shurman, J. W. McRea, A. D. McLachlin, C. E. Duerr and F. S. Skinner.

St. Louis Motor Car Co.—E. H. Phipps, R. T. Peckham, T. B. VanAlston and Jesse French, Jr.

Smith & Mabley Mfg. Co.—C. R. Mabley, A. D. P. Smith, S. M. Thornton and J. S. Bunting.

Springer Motor Vehicle Co.—J. H. Springer, A. N. Von, William Myers and L. D. Cole.

Standard Motor Construction Co.—C. C. Riotte, E. A. Riotte, R. C. Radcliffe, H. F. Brooks, Matthew Conroy and Charles Fox.

F. B. Stearns Co.—F. B. Stearns, W. F. Bonnell, Roy F. York, J. G. Sterling, George F. Woolston, James F. Patton, J. L. Botsford, Arthur Holden and Eugene Rider.

J. Stevens Arms & Tool Co.—C. C. Hildebrand, Otto Nestman, Robert Magna, E. J. Murphy, George Fortier and John Jones.

Studebaker Automobile Co.—T. W. Goodridge, Peter Dumont, Richard Bacon, H. Vanderbeek, George C. Sparks and A. M. Welch.

E. R. Thomas Motor Co.—E. R. Thomas, president; S. F. Heath, E. L. Thomas, Percy F. Megargel, J. M. Edsall, Fred Nehrvas, Carl T. Paxon, A. D. Shultz, E. Richards, C. A. Coey, Richard D. Henshaw, H. S. Houpt, Fred Titus, C. S. Henshaw and V. J. Jacobs.

Union Automobile Co.—T. H. Dwight, J. W. Lambert, G. B. Laughterbach and J. F. Dorr.

Upton Motor Co.—Colcord Upton, Fred P. Upton and Fred C. Naudin.

Vehicle Equipment Co.—J. T. Rainier, C. G. Rainier, T. N. Lineberger, J. R. Kinsey, P. C. Chrysler and Messrs. Kibbe, Lesser and Ficklin.

Walter Automobile Co.—A. J. Picard, William Wallace, Russell Driscoll and A. Porthun.

Waltham Mfg. Co.—Harrison Williams, president; L. B. Gaylor, Leo. Melanowski, C. C. Lozier, O. G. Bechtel, E. P. Chalfant, W. H. Little, W. S. M. Mead, T. E. Griffin, W. J. Behn, L. H. Roberts and John Robbins.

Wayne Automobile Co.—William Kelley, Roger J. Sullivan, H. C. Sharps, L. C. Howard, W. U. Watson, G. C. Lewis and Walter McMasters.

Welch Motor Car Co.—A. R. Welch, R. Brandreth, Frank B. Head, A. J. Becker, J. G. Peebles, H. M. Ambler, and Messrs. Bird and Archer, of the Bird-Archer Co., New York representatives.

White Sewing Machine Co.—Windsor T. White, Walter C. White, Paul H. Deming, Carl H. Page, George H. Lowe, Webb Jay, F. L. Hewlitt, J. W. Ball, R. N. Searles, M. R. Green, J. R. Parker, B. F. Adams, J. H. Parsons, D. H. Rankin, W. C. Ashley and H. C. Westley.

Winton Motor Carriage Co.—Alexander Winton, C. B. Shanks, C. W. Mears, C. H. Tucker, Harry Fosdick, C. M. Brockway, H. L. Owesing, Percy Owen, F. O. Hinchcliffe, and A. E. Maltby.

Worthington Automobile Co.—W. J. P. Moore, H. R. Worthington, H. L. Lounsbery, Carl Almquist and Edward Fifield.

Show News Notes.

A number of exhibits were delayed in transit and explanatory signs in empty spaces were frequently seen during the first few days of the show, especially in the exhibition hall. Among those thus delayed were the Bartholomew Co., of Peoria, Ill., makers of the Glide automobile; the Warren Automobile Co., of Warren, Pa.; and the Model Gas Engine Works, of Auburn, Ind., description of whose cars will be published next week.

Wm. P. Shattuck, of Minneapolis, Minn., who is connected with a firm exhibiting at the garden, was robbed of a fur-lined overcoat on Tuesday evening. The coat was lined with the skins of eighty-six muskrats, shot by Mr. Shattuck and his wife while on an automobile tour in Dakota.

Much complaint was heard of the charge of twenty-five cents, half the price of the admission to the show, for putting an overcoat upon a dusty shelf in the coat room. A charge of ten cents would have been ample; the shelves might have been dusted in any event.

The quietest place in the entire show was the writing room, in the southwest corner of the building, on the second floor. The door leading from the concert hall to this room was closed by exhibits, and it could only be reached by means of the corridor, back of the concert hall, and in front of the barroom. This passage was used as a café and was almost filled with tables and chairs. In consequence the few persons who penetrated the maze to the writing room found it most agreeably quiet and at no time was it crowded. The noisiest place was declared to be the press room.

Considerable comment has been caused by the fact that the American Motor League was able to obtain quarters in the Madison Square Garden, while the American Automobile Association was compelled to go to a hotel in the neighborhood. The A. M. L. had quarters in a hotel on Twenty-seventh street, and, in addition, a desk in the corridor leading from the concert hall to the writing room, in the southwest corner of the second floor of the garden. Railway certificates were signed in the office at the hotel, while at the Garden applications for membership were received.

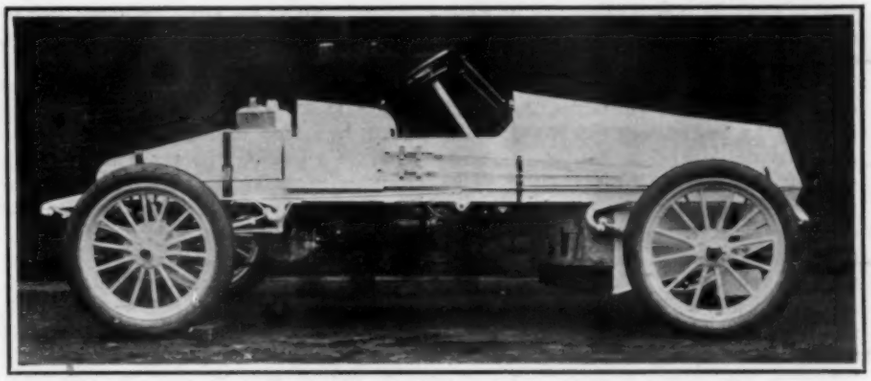
Scattered throughout the crowds in the Garden on Wednesday were hundreds of persons wearing red and gold badges. They were everywhere. Enquiry elicited the fact that the Maxwell-Briscoe Motor Co., of Tarrytown, N. Y., had sent all its employees and their families to the show in a special train, there being about 600 all told. The factory was shut down for the day, while the visitors enjoyed themselves, their badges entitling them to free admission and allowed them to pass in and out at will.

THE WEIR CUP.

The prize cup shown herewith, has been offered by Col. L. C. Weir, president of the Adams Express Company, for the Corinthian race on the Ormond-Daytona beach.

The race is open to amateur owners and drivers only. The cup stands 17½ inches high, being 8⅞ inches wide in the body. It contains 85 ounces of silver and 60 ounces of copper.

There is a marked tendency among foreign builders of auto boats to increase the power of the motors.



Herewith is shown the racing car which the White Sewing Machine Company has entered in the free-for-all events at Ormond. The entire mechanism exhibits the characteristic features of the White system of generating and utilizing steam, but the dimensions of all parts are increased, and the arrangement is different from that in the White touring car. The car is of compact, rakish build, and is rated at 40-horsepower. The generator is placed in front, and the engine is mounted horizontally under the driver's seat, with central chain drive to the rear axle. The weight of the car is 2,120 pounds. The car will be driven by its designer, Rollin H. White.

Sand-Clay Roads of the Southern States.

AUTOMOBILE tourists of the Middle Western and Southern States of this country cannot fail to have noticed places in which clay roads and sand roads were to be found quite close together, and to have remarked the fact that in dry weather the clay road is, if not too rough, much better than

FIG. 1.

the sand road, whereas, in wet weather the reverse is the case. The query, why the two materials might not be combined to make a road serviceable in any weather, must have occurred to many, and it is answered very well in a report by Special Agent W. L. Spoon, of the Office of Public Road Inquiries, in the last Year Book of the United States Department of Agriculture. According to this report, sand-clay roads are frequently found in Southern States. They are variously successful, and some of them, for the reasons which the author pionts out, have not been at all successful. but here and there roads of this character are to be found which are never bad in any weather, and require almost no repairs.

To obtain roads of this sort is only a question of having the right sort of sand and clay, and of intelligently mixing and laying the two. What is meant by the right kind of material is well illustrated by some diagrams of magnified sand particles mixed with correct and incorrect amounts of clay. In Fig. 1, coarse, sharp sand is mixed with clay to the point of "saturation," by which is meant that just enough clay is used to fill the interstices between the sand grains without ever preventing the latter from coming into full contact. With this kind of mixture the sand grains bind on each other and will resist a great amount of pressure and wear. When too much clay is used, as in Fig. 2, the sand grains are not in contact, and will sink when the road is wet, the clay being converted into mud. When the sand is too fine to absorb sufficient clay, or where the grains are worn round, we have the condition shown in Fig. 3, with which it is hard to avoid a dusty or muddy road.

It is pointed out further that for a successful result the material must be reduced to a compact homogenous mass, and that to do this it is necessary first to moisten the clay, and then mix or "puddle" it thoroughly. It is usual to spread from 4 to 6 inches of clay over a sand foundation, where the natural soil is sand, or 6 to 8 inches of sand over a clay foundation, where the latter is the natural soil, and to use a roller and scraper as necessary. The mixing of the sand with the clay is usually done by the traffic itself, which is not excluded from the road when the latter is in process of making. This is the critical period in the construction of the road, and requires careful attention.

It is necessary also to pay special attention to drainage for this class of road. The surface must be drained somewhat more than with macadam, and the side ditches or sub-soil drainage must be carefully looked after, since water adds nothing to the value of a sand-clay road beyond a very limited amount.

With the ordinary method of making these roads, there are certain spots with a deficiency of either sand or clay, and these

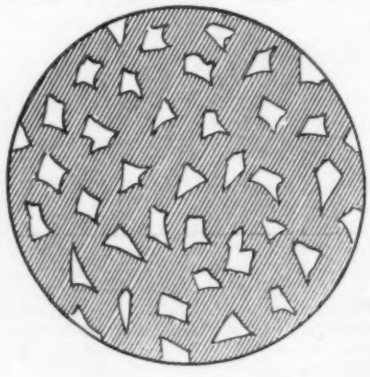


FIG. 2.

must be gone over from time to time, and sand or clay added as required. If this is done regularly for a few years after the construction of the road, the result will be a highway which will stand in any weather, and require almost no repairs.

A fine grade of gravel, such as is found native in many localities, may advantageously be added to the sand-clay road in place of a portion of the sand. The sedimentary or chalky clays are the poorest for road-building perhaps, as they are the most dusty and have the poorest binding qualities. The ferruginous clays are the best binders. Whatever the material, the roadbed should be at least 20 inches above standing water in the ditches, and more if it is over a dozen feet wide.

A certain difficulty with the sand-clay road is encountered in northern latitudes where the frost line extends deep. Frost is temporarily destructive to a sand-clay road, since it disintegrates the mixture and produces a slushy mud. However, this repacks after a rain, although frequently leaving the road surface somewhat rough. Where the frost line does not go more than a few inches deep, as in the Southern States, the effect is not serious, but in all cases the mixture should extend a few inches below frost line, to give a good foundation.

It is useless to try to make a good sand-clay road where there are wet weather springs, unless they are thoroughly drained. Usually it is best to carry the road around such wet places, or, if that cannot be done, to use sand alone in them. The cost of these roads is very small, the principal item being for the hauling of the material. The critical period in the construction of the road is when the mixing is being done by the traffic, and if the road is cared for intelligently during this period the results are certain.

Motor Ambulance.

There has just been completed in England a motor car which is intended to give complete protection to the Royal Army Medical Corps while on service in the field, and as this purpose would be of the greatest of importance in times of war, the British War Office and the heads of the R. A. M. C. at once arranged for an inspection of this latest addition to the ranks of automobilism. The car was built by the Ivel Agricultural Motor Co., the motor itself being built for heavy work on the same lines as the agricultural motors turned out by this concern and being capable of hauling not only a heavy service cart, but also a passenger load of nearly thirty persons. The car is protected by armor shields built of quarter-inch bullet-proof steel, and successfully resisted all attempts made to penetrate its wall in a recent trial at Bisley. The walls, however, can be folded together, while the ambulance motor, as it has been dubbed, is in motion, but on their being spread out a large red cross

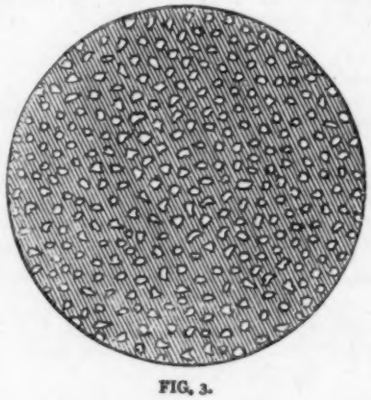


FIG. 3.

appears on each shield, as a sign to friend and foe that the vehicle is used only for hospital purposes, bringing first aid to the wounded.

All the authorities have expressed their satisfaction with the car, which will probably be added to the service wagons of the Royal Army Medical Corps.

TECHNICAL FEATURES AT IMPORTERS' SALON.

Show Increases in Interest as New Exhibits are Placed.—Some of the Novelties and New Models Direct from Paris.—Gobron-Brillie Makes Debut.

As was anticipated from the fact that on the opening day of the Importers' Salon many of the 1905 cars destined for the exhibits were either afloat or in the Custom House, the show gained noticeably in interest from day to day after the opening.

The Charron, Girardot and Voigt stand received on the second day a polished chassis of the latest C. G. V. model, and a motor cut open to show sections through the cylinders and valve chambers, both direct from the Paris show. This chassis retains the armored wood frame which that firm has used with success for the past three years, consisting of square steel tubes about 5-64 inch thick and (from memory) a trifle over 2 inches square, filled with wood, and, for the heavy coupé and similar bodies, having the side members trussed for greater strength. The motor has separate cylinders, with integral water jackets whose horizontal section is square and whose adjacent sides are cast open and covered by rectangular brass plates. The valves are opposite and mechanically operated. A light steel pan is secured to the frame under the motor and gear box, but is not depended on to support them.

An interesting feature is the use of a diminutive gear pump for supplying oil to the engine cylinders and bearings. It is identical in pattern with the gear pump used for the water circulation, and, like it, is driven by fibre gears from one of the cam shafts. By this pump the oil is carried to a row of sight feeds on the dash, and the surplus oil not passing through the sight feeds returns through a by-pass valve to the oil tank. Both the water and gear pumps are driven by dogs acting on flat radial springs, which save them from shock and serve as renewable breaking places in case of the pipes freezing or becoming clogged.

The flywheel has fan-blade spokes, and the conical clutch is similarly equipped, this being one of two motors observed in which fan-blade spokes are used with the regular conical clutch, the other being the Gobron-Brillié. The Renault, as is perhaps generally known, has a flywheel fan and conical clutch, but the fan-blades are of sheet metal and are attached to the outside of the flywheel rim.

High Tension Magneto Ignition.

The regular C. G. V. ignition equipment is a Simms-Bosch high tension magneto, with distributor on the armature shaft, but some of these cars are supplied with battery spark coils and separate timer in addition. These, it is explained, are used mainly when it is desired to run the car at a slower speed than that which would give a good magneto spark. The motor shares with the Hotchkiss the distinction of having ball bearings on its crankshaft, these being of the same make in both machines. Ball bearings are used also throughout the gear case and on the differential shaft, as well as in the wheel hubs. The gear box, which has been changed considerably in the last two years, gives four speeds as before, but with direct drive on the high speed. The bevel driving pinion is attached to a sleeve running loosely on the rear end of the first gear shaft, which is fluted to carry the sliding gear carriage. At the rear end of the second gear shaft is a gear constantly engaging a somewhat larger gear secured to the bevel driving pinion. In the direct drive a claw clutch connects the gear carriage and the large gear just mentioned. In the C. G. V. car this gear and its mate are of the herring-bone type, each being made up of a pair of gears with skew teeth at opposite angles. In the Hotchkiss car the same arrangement is used, but the gears constantly meshed are plain spur gears of rather more than double width of face of the speed gears.

The C. G. V. clutch spring and ball thrust bearing are enclosed by a good sized case which is filled with grease, thus preventing the lubricant from getting to the clutch faces. A feature of interest is what may be called a spring universal joint connecting the clutch shaft and the first gear shaft. It is composed of two abutting flanges which enclose four pairs of short helical springs interposed between four lugs cast on the flanges.

M. Emil Voigt, at the stand, told the representative of this paper that his firm will shortly open a New York store of which he will be in charge for four or five months of each year. The full C. G. V. line for this year comprises four powers, 18, 25, 40 and 60 horsepower. The sectional motor exhibited at this stand, which is certainly a beautiful piece of work, is understood to have been purchased by the French Government for the School of Engineers in Paris.

Workmanship on Hotchkiss Car.

The Hotchkiss car, which is referred to above and in last week's article, is noteworthy mainly for the mechanical excellence of various details. For example, the brake tension rods are adjusted by turnbuckles which are locked in a very simple manner. One rod adjacent to the turnbuckle is squared, and a two-lobed clip pinned at one end to the turnbuckle is snapped over this square, thus locking the turnbuckle. The same thing was observed on the Fiat car. The writer was a little surprised to note that the dust pan, into which the crank case spread itself on each side, was formed integrally with the bottom instead of the top half of the crank case. This arrangement of the motor support makes it evidently necessary to lift off the upper portion of the motor to get at the crank pin bearings. The use of ball bearings in this crankcase contributed noticeably to compactness, a feature conspicuous also in the C. G. V. motor.

An unusual but very neat detail was the carrying up of the right side of the gear case cover into a housing surrounding the lever operating the gear shift.

At the Richard Brazier stand a chassis of the latest model was shown. It did not appear to be greatly changed from the last year's model, but had some departures in matters of detail. Chief of these is the use of thermo-siphon or gravity circulation in place of the usual pump. In connection with this is a small tank carried backward from the top of the radiator for a few inches. The well-known success of Renault Freres in the use of this system for many years past has made it seem only reasonable that other builders could do as well if they wished.

The gear shaft lever now acts directly on the gear box instead of through linkages, as before, this change having been accomplished by moving the gear box a little further forward and the base of the levers further back. The engine and gear case are carried on a tubular false frame, whose rear ends slant upward and outward to move the side members of the frame. This is in keeping with the very light character of the construction generally, of which this machine is a conspicuously successful example. The Truffault suspension or shock absorbing device is applied to all the springs.

The ignition is by Simms-Bosch low tension magneto, and there is no way of advancing the spark by hand when running, though a device connected to the starting crank latch retards it for starting. The argument of the makers is that at high speeds the spark is so much hotter than at low speeds that the flame propagation is intensified in proportion to the engine's speed.

Brakes on Renault Chassis.

The new Renault chassis, as has already been announced in these pages, marks the abandonment by this celebrated firm of the tubular steel frame. The frame is now pressed steel and elevated over the rear axle similarly to the Darracq. A feature instantly noticeable in the chassis is the enormous size of the brake at the back of

the gear box. The gear shaft carries a drum which is grooved externally into a number of ribs, doubtless to facilitate the dispersion of heat; and an internal expanding ring is supported by a bracket on the gear box, and operated by a pedal under the right foot. As may be remembered, last year's practice in the Renault cars was to put this brake on the bevel pinion shaft, doubtless to avoid transmitting the braking stresses through the cardan joints of the propeller shaft, but evidently these joints have been found strong enough for the double duty.

The cylinders are cast in pairs and the motor and gear box are supported on a conventional false frame. A short cardan shaft connects the clutch with the first gear shaft, and the end thrust by which the clutch is released is exerted through this shaft. The frame in general is very stiff, being provided with corner stiffeners of regular channel section and of extraordinary size. Evidently the abandonment by these makers of the tubular frame does not mean that they have accepted the idea of frame flexibility. The springs, as always, are very long.

In addition to the throttle of the automatic carbureter—itself a new design—a variable lift device is used with the mechanically opened inlet valves, it being the same in principle as the De Dion variable exhaust valve lift. This device was used last year, but it is operated this year by a lever under the steering wheel and placed so as to move a sleeve on the outside of the steering column.

Interesting Fiat Features.

A chassis was shown at the Fiat stand, and, although it was not the latest model, it had some interesting features. Among these perhaps the chief was the use of two connected brakes, one on the differential and the other on the front end of the second gear shaft. These brakes were quite similar to those of the Mercedes, of which the Fiat is in many respects a copy, but instead of being applied by separate pedals, as in the latter machine, both are applied at once through the medium of a floating lever connecting both with one pedal. The gear shaft brake band is tightened by a right and left hand screw. This same brake pedal also released the clutch, and acted on the throttle foot button (a feature of the Fiat cars) to slow down the engine. Both brakes are cooled by water drip. As already implied, the drive in this machine is not direct, on the high speed, and indeed it may be questioned if the direct drive is much to be preferred when more than three speeds are used.

The throttle button above referred to takes essentially the place of the retarding or accelerating pedal and is connected to a throttle lever on the steering wheel. The spark is advanced automatically by a separate governor, this arrangement being the same as used in the Fiat last year. The ignition is by Simms-Bosch low tension magneto. Lubrication of the engine is effected substantially as before, save that a series of small chains has taken the place of the bucket chains which last year lifter the oil from the reservoir to the little cups from which it overflows into the pipes leading to the bearings. As the gear shafts and differential shaft run in ball bearings separate oil lubrication is not required for them.

The writer was informed that the 1905 Fiat clutch will be radically different from the old one, which was quite similar to the wind-up Mercedes spring clutch. The new Fiat clutch will be of the multiple disk type, having steel and bronze disks alternately connected to the flywheel and to the clutchshaft. A spring will normally press these disks into engagement, when their large collective surfaces will permit low specific pressure and very gradual starting. When the spring is released the disks will separate and the oil in which they run will keep their surfaces lubricated.

Special Martini Feature.

Although the Martini car is known to be under the Rochet-Schneider patent it disclosed several interesting differences from its parent car. The rear of the frame is supported on platform springs instead of on semi-elliptics. The I-beam axles are hand forged, and look like very fine pieces of work. The downwardly curved car front axle in particular may be mentioned on account of having the web and flanges carried inwardly to accommodate the spring seats, so that the latter have the appearance of being a part of the axle itself, instead of looking like excrescences as usual. The gear shifts are operated on the selective system, and the gear quadrant is exactly like the Mercedes, having three slots and a latch to prevent the reverse being accidentally thrown in. The gears, which drive "indirect" on the high speed, are larger than the usual French practice, and suggest more the design of an English car.

There are two separate brakes acting on the differential shaft, and neither of them is connected to the clutch. Instead of the ratchet and pawl, which in the Rochet-Schneider take the place of the usual sprag, there is a pawl attached to each of the radius rods and acting when let down by the operator on the teeth of the large sprocket wheels. As the pawl acts as close as possible to the wheels, it is evident that when it is thrown in it will either kill or cure the worst case of coasting backward. Of course the ordinary distance rod would not stand this sort of usage, but the distance rods of the Martini are of pressed steel, with a very deep web as they approach the rear axle. They are made integral with the disks which close the brake drums, and are stiff enough to be themselves the supports of the brake rings.

This car gives another example of the recent fondness of the Continental builder for the metal to metal clutch. The Martini clutch has an internal expanding ring supported at one point by an arm on the clutch shaft, and split opposite this point and expanded by a long wedge forced home by a stiff coiled spring. This wedge is long enough to permit the clutch to be adjusted by shifting the wedge on its carrier. The whole is enclosed in a grease-tight case, and the free ends of the clutch ring are held against the action of centrifugal force by a heavy helical spring.

Ball Bearings in Transmission.

Ball bearings are used throughout the transmission, in fact everywhere except in the motor and steering gear. The makers recommend the use of thin grease to lubricate the gears; and it may here be noted that in a number of other cars besides this the absence of protection for the ball bearings from the metal grit worn from the gears is accounted for by the use of grease instead of oil. That the grease contributes to the life of the gears cannot be questioned, and it would seem that the main reason for not using it in gear boxes having plain bearings is the inability with some arrangements of lubrication to get the oil to all the differential bearings. When ball bearings are the rule throughout, this difference of course no longer obtains. It should be noted, however, that queries addressed to several makers elicited the information that they still use oil in their ball bearing gear cases, although the bearings have no especial protection against the entrance of this oil, with whatever it may carry with it.

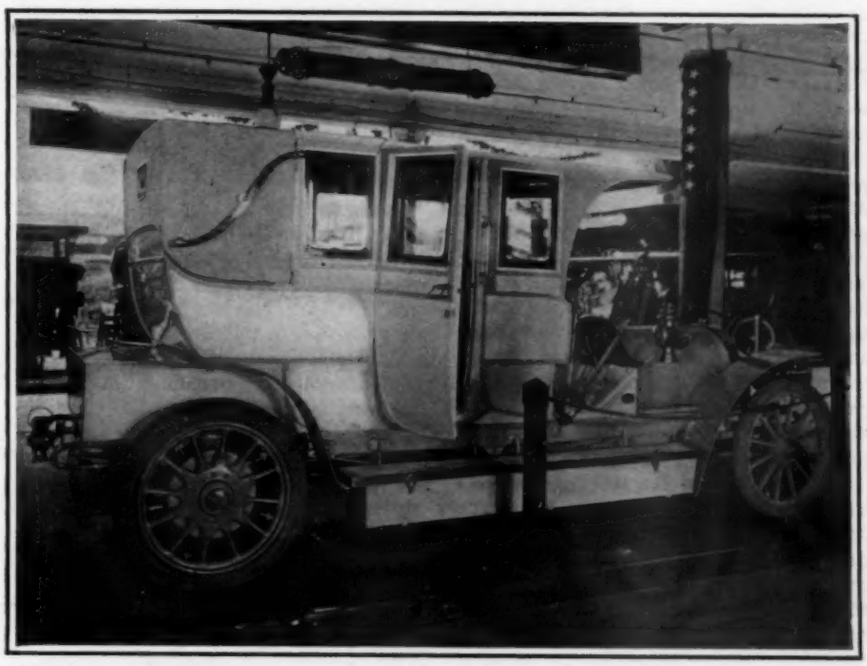
Another neat detail of the Martini is the provision on one of the sprocket shafts of a clamped sleeve having lugs which could engage lugs in the adjacent end of the differential hub, so that by slackening the screws holding this sleeve and shifting the sleeve till the lugs engaged the differential might be locked in case of any of its gears breaking on the road. The carbureter of this car did not appear to be automatic, but is provided with a jacket of generous dimensions extending some distance up the mixture pipe and connected with the exhaust, the object being to prevent condensation of the gasoline on the walls.

The gasoline tank is at the rear of the frame, which seems to be a popular arrangement to-day; and, instead of its beiug connected with the exhaust, an air pump driven by a little friction wheel is arranged to supply the necessary pressure to lift the gasoline to the carbureter, an auxiliary hand air pump supplying the air pressure for starting. A single Dubrulle mechanical oiler pumps oil through a branched pipe leading to all the cylinders; the main bearings and crank pins are oiled by splash, and two relief tubes, one from each end of the crank case (which is partitioned across the middle), are carried up and end in filler caps through which oil may be poured. The connecting rod caps have oil scoops, and the usual oil holes are provided in the top of

the rod end besides. The gasoline tank is equipped with a sight gauge having a slide, a quarter turn of which covers the glass and protects it from injury.

Delahaye Car Details.

An unusual feature of the Delahaye car examined, which, by the way, is not of this year's model, but which differs from the 1905 car only in a few details, is the separation of the differential shaft from the gear box and its mounting as an independent entity under the rear floor, some two feet or more back of the gear box itself, which was under the front footboard. A longitudinal shaft, with slightly loose couplings at each end, connects the gear box with the bevel pinion in the case surrounding the differential. In this way both the gear box and the differential are readily accessible by taking up the floor boards. The



SPECIAL TOURING BODY BY V. MOREL ON HOTCHKISS CHASSIS.
Note rear extension box with platform for baskets; also long box under running board.

transmission of this car comprises four speeds with direct drive on the high gear. No ball bearings are used. There is no false frame, the gear box being on two cross members of the built up frame. The cone clutch is provided with ready means for renewing the leather, this being a Delahaye patent. It consists of bolts in the form of tees with the top part of the tee engaging the leather and sunk in slots in the conical ring. The 1905 car has a high tension magneto, mechanically operated inlet valves, and supplementary battery ignition. The lubrication is by gravity sight feeds on the dash to the cylinders and main shaft bearings, and by splash to the crankpins. The gear shafts are lubricated by grease forced from a large pressure cup on the dashboard, through a distributing valve which sends it to one or another pipe as desired. Both brakes when set release the clutch.

The transmission of the new Richard Brazier chassis gives four speeds ahead, with direct drive on the high speed, the arrangement of the gears and shafts being exactly like the C. G. V. and Hotchkiss. The reverse pinions are stationary when not in use. The cooling fan runs on ball bearings and is driven by a belt: the fan bracket is supported by three studs, and is slotted on two of them, so that it can swing on the third to take up the stretch of the belt.

Bollée Unusual Features.

One among a number of unusual features of the Bollée machine is an arrangement of the sprocket pinion shafts by which they are free to move endwise to a small extent, the purpose being apparently to permit the chain to find its own alignment at high speed, or turning corners. The inner ends of these shafts are squared and work freely in squared hollow shafts connected to the differential gears. Compression springs determine their normal position. A feature which might escape the casual observer is that the spark timers of both the high tension magneto and the battery circuit are connected so that one lever advances the spark in both systems of ignition. The transmission gives four speeds, and is not direct on the high gear.

Ball bearings are not used in the gear box. An unusual feature of the transmission is that one must pass through the first speed to go from the neutral position of the selective quadrant to the reversing position. The argument seems to be that, as one must always pass through the first speed in going to or from the reverse, it is more convenient to have the forward speeds arranged as they are, one being always reached immediately from the neutral position in the center. The circulating pump on this machine is of unusual character, but its construction could not be learned. It was described as a volumetric or positive pump, and it runs at three times the speed of the magneto, which is driven from the pump shaft by a spur pinion and internal gear.

Newcomer in Gobron-Brillié.

Another machine new to this country, but well known by name, is the Gobron-Brillié. The peculiar balanced engine of this machine is well known. The most interesting feature of this machine was the clutch, which is a double cone. The regular aluminum leather-faced cone engaging the flywheel rim is attached loosely to a metal cone fitting into a female cone cast on the flywheel. This second cone, which is about one-third diameter of the flywheel, is backed by springs and engages a little before the rim clutch, thus giving additional driving power and yet soft action. The transmission gives four speeds, with direct drive on the high. The arrangement of the gears is much like that in the Peerless machine, the jack shaft carrying a large gear in constant mesh with a pinion on a sleeve at the front end of the gear box. This sleeve is driven direct from the clutch, and the front end of the shaft carrying the sliding gears turns loosely in it. The gears are of somewhat unusual diameter, and the teeth, though not wide of face, are remarkably high, in sharp contrast to the stubby profiles usually preferred. Ball bearings are used throughout. Another feature which was calculated to excite comment was the use of regular D. W. & M. radial ball bearings to support the thrust of the bevel gears. This device had last year the sanction, such as it was, of Mercedes practice, but the 1905 Mercedes uses regular ball step bearings, which are certainly better for the purpose. The Eisemann high tension magneto is used, without alternative batteries. The distance rods are bolted at the rear to the large disks which close the brake drums. They have swivel bearings on the axle, and support the brakes, which therefore impose no stresses on the axles. The frame is of steel pressed in one piece, and is much like the Rochet-Schneider. The carbureter is automatic, and a neat detail is the attachment to the adjacent side member of the frame of a plunger pin acting through a spring on the "tickler" of the carbureter.

Peugeot Car Brakes.

In the Peugeot car both the pedal and emergency brakes release the clutch. The axles are of the I-beam section that seems to be everywhere popular this year. The frame is of pressed steel as usual, but catches the eye for the reason that the rear spring hangers are raised at least a couple of inches, or, what is the same thing, the frame is dropped to that extent below the ends

of its springs. The rear brakes operate through a long transverse equalizing lever, which takes the place of the usual tubular shaft and wire cable. The throttle in this car is connected to a screw stem which seems to be located directly over the spray nozzle and to be intended to govern the amount of gasoline sucked. Ignition is by the Simms-Bosch high tension magneto, with alternative batteries and separate spark timers.

Built on Renault Lines.

A car built on Renault lines, or rather the lines followed by Renault a year ago, but obviously of much less costly construction than the Renault, is the Corre. Like its former prototype it has a tubular frame, provided with a tubular false frame carrying the engine and gear box. The side members of the frame are trussed, and the rear axles and propeller shaft remind one strikingly of the more celebrated machine. A Mertel motor of 18-20 horsepower is used, and ignition is by battery and separate gears. The Xenia carbureter is fitted, and the place of a governor is taken by a connection from the clutch pedal to the throttle, so that releasing the clutch retards the motor. The carbureter has an automatic inlet, and should be quite efficient. The transmission gives three forward speeds, with direct drive on the high speed. Sliding gears are used, and the gear box is of bronze. Circulation is by pump instead of by gravity, this being necessitated by the fact that the water tank is attached to the front of the dash while the radiator is in front below the frame.

It will be seen that the novelties are of detail only, yet the cars taken on their own merits will repay a close personal inspection.

Car Bodies at the Importers' Salon.

IN the line of covered and enclosed cars there is much that is interesting in the Importers' Show in New York, including as it does the work of the most famous of the European body-makers. Incidentally, it may be said that the one American company represented at the Herald Square Exhibition Hall has nothing at all to fear from foreign competition; whether viewed at a distance for the broad artistic effect, or scrutinized minutely for detail and finish, it can fully hold its own even in this good company.

The fact that the runabouts and small and cheap cars find no place in this show serves of itself to concentrate the attention upon the more expensive classes of bodies, which may here be seen to the best possible advantage.

Types of the New Year.

The tonneau is present in small number, there being a few of the old type and some of the *Roi des Belges,* with rear entrance. The popular type of car is now the double-phaeton, a development of what is known in America as the surrey. Some very handsome and comfortable examples of this type are shown, both with and without tops of various forms. Next in the extent of protection is the phaeton with cab back and extension top, the sides protected with canvas curtains. The landaulet is shown in some of the best makes, and there are several fine examples of the limousine body. In the larger class of cars there is one berline, with two of a new type perhaps best described as "palace" touring cars.

While it is true that in all the multitudinous details of motor and chassis there is a substantial agreement among the leading makers, as stated in the report last week, there is nevertheless a noticeable change in the proportions of running gear and consequent effect upon the dimensions and form of body. With the perfection of the pressed steel frame supplemented by the modern systems of sliding and cardan joints it has been possible to get away from the practical necessity for cramped seating space and uneasy riding. The chassis has been lengthened to a point which greatly increases the easy-riding qualities of the car, the added length of body gives almost an excess of room for the passengers on the rear seat, in fact, making possible an extra seat for two when needed, and there is ample room clear of the rear wheel for the side door.

The necessity for the side entrance was shown a couple of years ago when the ordinary tonneau was still at the height of its vogue by the many efforts to make an entrance by the swiveling, or the lifting of one of the front seats, even though no actual room was gained after the passenger had entered the car.

An incidental but important detail of this modern construction is the long, broad and low step known as the running-board, now of wood covered with rubber tread, a welcome substitute for the one or two separate iron steps of the older cars. This construction gives useful room for a tool-box either as a part of the running-board or as a drawer beneath the latter, with ample room for battery box and acetylene tanks.

While the first enthusiasts were well content to speed in the open air, regardless of weather, the demand for suitable protection has been more and more apparent as recruits from new classes have been added to the ranks of automobilists. The general expansion of the car here indicated has been promptly utilized by the body designers, until, at the present time, the enclosed or at least covered car that was a rare exception a few years ago is now built abroad in greater numbers than the open car.

The possibilities of automobile cruising, if the term is permissible, are well indicated by the principal feature of the de Dietrich exhibit, a 30-horsepower chassis with a body by Maple & Co., of London. This body has ample room for four persons, each seated in a comfortable revolving armchair, with a writing desk on each side of the car and a refrigerator under each desk. The body is built with rounded corners, and windows on all sides, the corner glasses being curved; the sides, door and ceiling are panelled in very handsomely grained maple, to match the furniture. The windows are fitted with curtains of sage green lined with yellow. There is an electric indicator for communication with the driver, electric light and pockets for maps. The windows open in warm weather. The outside of the body is finished in dark green. The driver's seat is single, of the full width of the car, with a separate roof over it and a glass front. There is a tool box on the running-board and extra storage space is provided under the body. The entrance is by a full door in the rear. The car is adapted for touring, regardless of weather.

An American Palace Car.

A similar touring car of still greater power is shown by J. M. Quinby & Co., of Newark, New Jersey, makers of the body, which is mounted on the new 45-60 Decauville chassis. This car is the most complete yet seen in this country; the body is a handsome piece of work, finished in maroon with black moldings, the chassis and wheels being of vermilion. The entrance is by a full door in the front on the near side, opened by swinging up the near half of the front seat. The rear seat is wide and roomy for two persons; in the off front corner there is a fixed seat covering a water-closet of yacht type, supplied by a twenty-gallon water tank on the roof. A hinged seat against the door accommodates a fourth passenger inside, while a fifth is provided for next to the driver.

The windows all open, and there is an electric light in the roof, with an electric course indicator to the driver. Over the W. C. is a folding yacht lavatory with basin and running water, a mirror being hinged to the roof, so as to swing down. Tables hinge upward from the sides. Writing materials are stowed under a flap in one corner, and toilet articles in another. A clock and other small articles are stowed in convenient places, and beneath the body is an icebox and a tool box. The luggage is carried on top. The whole outfit is shipshape in the extreme, with a place for everything and anything—down to a pack of cards for the table in its place.

Berline on Bollee Chassis.

The berline shown is on a Leon Bollee chassis with very long wheel-base and 40-horsepower motor; the body by V. Morel, of Paris. The exterior finish is of dark blue with black moldings over a yel

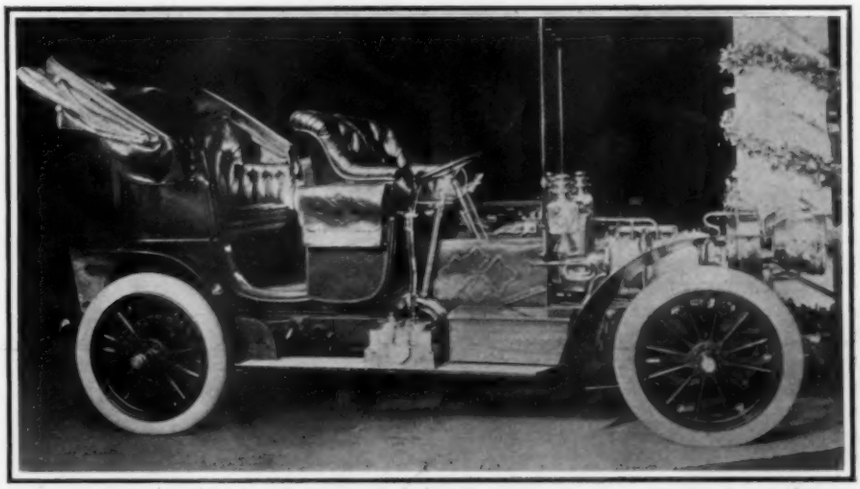
low chassis and wheels; the interior finished throughout in a drab cloth. There are seats for five within the body, a wide rear seat, two revolving chairs, and an extra seat hinged to the back of the driver's seat. The length of body gives comfortable room for the seating capacity. An extra passenger is provided for beside the driver. The roof extends over the driver's seat and carries a luggage rail.

Among the Limousines.

The Pipe exhibit includes two handsome limousines, both on 15-20 chassis. One body is made by D'Ieteren Freres, of Brussels, with full side doors and long running-board, giving a very easy entrance. The finish is in blue, with fine red stripe, the interior being in black leather; the sides and back upholstered up to the roof. There is a wide rear seat with two extra seats hinged to the driver's seat, and a folding table in two parts, hinged to each side, serves for cards or a meal, the four passengers facing. Electric lights are provided, with a speaking tube to the driver. The tool box is under the rear of the body, the roof has a luggage rail, and the driver is protected by the roof and a glass panel.

The other car has a body by Lucien Snutsel, of Brussels, similar in form and also finished in dark blue with red stripe, but with the lower part of the body in black with vertical red stripes, less sedate than the first car, but pleasing in appearance; the interior is finished in dark blue leather. The fittings include clock, pockets, electric lights and toilet articles. The tools are carried in a drawer under one of the long running-boards.

The Rochet-Schneider exhibit was incomplete up to the end of last week, the only complete car being a limousine with body by Kellner, evidently of last year. The roomy interior has two extra hinged seats, the outside is finished in dark blue with a fine light blue stripe and a series of fine vertical stripes relieving the lower part.



DOUBLE ROI DES BELGES PHAETON BODY BY A. BELVALLETTE, ON DELAHAYE CHASSIS

A de Dietrich body is shown on a 20-horsepower chassis, finished in dark blue with fine white stripe; there is a large plate glass window in the rear and wide side doors and running-board. The rear seat is roomy and there is an extra seat hinged up against the front end of the body, accommodating two more. The roof has a luggage rail and the driver is protected by side curtains and glass front.

Messrs. Hollander & Tangeman show one limousine, a handsome body with rounded rear corners, finished in black with light blue stripe with black leather inside. An extra folding seat is provided on each side, seating four in all in the body. There are full side doors and running-boards, with sprocket step. The windows are hinged so as to open completely.

A Mors chassis of 24-32-horsepower is shown with a body by J. Rothschild & Fils, finished in claret with black moldings and light red stripe, the chassis and wheels being of the conventional vermilion so generally used for these parts. There are full doors on each side, but separate iron steps for rear and front seats. The interior is upholstered, including the full sides and roof, with white and brown whipcord; nets for wraps, etc., being hung from the ceiling. The wide rear seat is supplemented by a folding cane seat with back on each side.

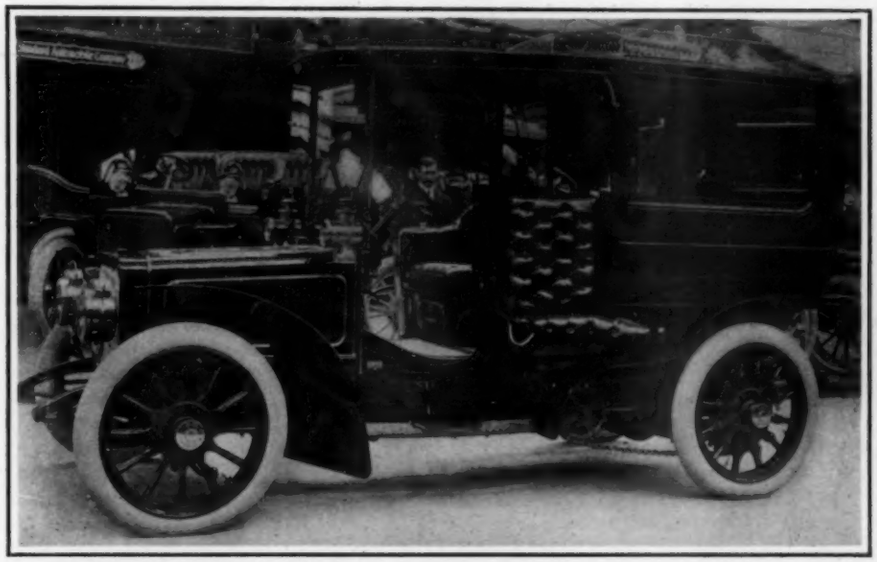
The Landaulet Class.

The Charron, Giradot & Voigt exhibit includes a landaulet with motor under the front seat, the body being by Muhlbacher & Fils, of Paris. The body has fixed seats for four and a single wide front seat, hinged to give access to the motor, of 18-horsepower. The body is finished in dark olive green with black moldings and red stripe; the chassis and wheels matching. Both top and inside upholstering are of black leather. A large stowage space is provided in the rear of the body and beneath the rear seat, with room for an extra tire, luggage, etc.

The exhibit of E. Lillie, representing J. Rothschild & Fils, is a landaulet, on a Mors chassis; the body in dark green with black moldings and red stripe; the chassis in vermilion. There are full side doors with two iron steps, and a glass front for driver.

Another Rothschild body is shown on an 18-24 Mercedes chassis in the Smith & Mabley exhibit, a landaulet seating four; finished in green with black moldings and fine red stripe over a maroon chassis; a handsome car.

A Decauville 16-20 chassis is fitted with a landaulet body by Quinby, of aluminum finished in Brewster green with black moldings and green stripe, the interior being upholstered in cloth of a different shade of green, the effect being quiet and in good taste. Full size doors from each side give access to the body, there is an side give access to the body and there is an extra hinged seat for two; a movable plate driver and another in front, both folding up to the roof. A speaking tube is also fitted.



QUINBY FRONT ENTRANCE OMNIBUS, ON DECAUVILLE CHASSIS.
Note this car is fitted with lavatory, for which 20-gallon water tank is fitted on roof.

Decauville Covered Phaeton.

In the Decauville exhibit is a rather striking car of less common type than the landaulet or limousine, a double phaeton with a cab back partly enclosing the rear seat, and a touring top. The body, by Suret Freres, of Paris, has two side doors and long running-boards with tool drawers beneath. The rear seat is very roomy and there is an extra "jump-seat," folding forward out of sight when not in use; the back to this seat slides up and down on two of the roof stanchions, and when not in use lies close up under the roof. The body and chassis are finished in white with very fine blue stripe and the upholstery is in fawn-colored leather. A glass front protects the driver, and luggage may be carried in two large leather cases strapped to the rear. This car was exhibited in Paris.

The Open Covered Cars.

The utility of the enclosed car is indisputable; it may be regarded as permanent, and it will always commend itself to a large class of motorists, but it is yet a question whether the majority will not decide, at least for summer and temperate climates, in favor of the open car with hood or other form of temporary protection. Most persons desire an ample supply of fresh air in riding, and they would rather take a certain amount of dust and rain with the air than to be shut up entirely. For this class the popular car is and probably long will be the double phaeton, of which many excellent representatives are now seen on the streets. This is in effect the old tonneau with a single wide and comfortable rear seat in place of the two corner seats and hinged center seat, the foot-room materially lengthened, giving more than enough room for the passengers and space for luggage as well, and convenient and easy entrances by doors from the running-boards. In the larger cars of this type there is room for a couple of revolving chairs in addition to the main rear seat, and in others a little smaller there is still space for movable seats for children or special occasions when a little crowding may be endured to accommodate extra guests.

The new 45-60 Decauville chassis is shown with a phaeton body by Locke & Co., of New York, a very showy car in bright red body, chassis and upholstery, the body moldings and striping being in black. The rear seat is wide, broad and with deep rounded back, almost like an old-fashioned sofa, large enough for three persons. There are also two deep armchairs on standards, so that they revolve, and in front are two more large comfortable individual seats. Wide side doors and long running-boards give easy access to all parts of the body and permit one to move from front to rear while the car is running. Two other phaetons are shown in this exhibit, one a 24-28 chassis with body in dark green with black moldings and green stripe, the upholstery being in olive leather. There are side doors, an extra "jump-seat," and running-boards with tool drawers beneath. The second car is of 12-16-horsepower with a Quinby body, of very attractive appearance. It is comparatively a small car, on a rather high chassis, but the body is handsomely lined and looks quite low and compact. There is the one wide rear seat with good foot-room and individual front seats, also with room to stretch the legs. The color throughout is Quaker green, very neat and handsome.

One of the striking cars of the show is the new 40-45 Mercedes in the Smith & Mabley exhibit with a body by A. Vedrine & Cie of Paris; a long body with deep wide seats; the body finished in maroon for both panels and moldings, with vermilion chassis and red leather upholstery. Long running-boards and sprocket steps on each side lead to the side doors; there is a movable canopy top with plate glass in rear and also in front, curtains on the sides, and luggage rack on top.

Another Mercedes has a Rothschild body with single swivel seat on the near side, one running-board and sprocket step. It is finished in crimson lake, with vermilion chassis. A large extension hood covers the passengers.

In the same exhibit is a 14-horsepower Renault chassis with a Kellner body, a side-door phaeton. The colors are striking, but not displeasing; the lower part of the body is dark blue, the seat backs are of crimson with black and yellow stripes, and the upholstery is in red leather. A victoria top is fitted.

Two fine examples of Parisian work, by Rheda and by Th. Botiaux & Cie, are shown on Richard-Brasier chassis, both side-door phaetons with wide doors and easy approach from the running-boards. Unlike the majority of the class at the show, the seats have low backs, giving the appearance of moderate size; but they are so modeled in form and proportions as to be most comfortable. No extra seats are fitted, the whole space being left for the two, or even three, persons on the rear seat. The front seats are equally comfortable. The Rheda body is finished in pearl gray with a fine red stripe; the lines of the body are particularly graceful. The Botiaux body is finished in green, with fine yellow stripes and vermilion chassis, the upholstery being in olive leather. The first car is of 20-horsepower, the second of 30-horsepower.

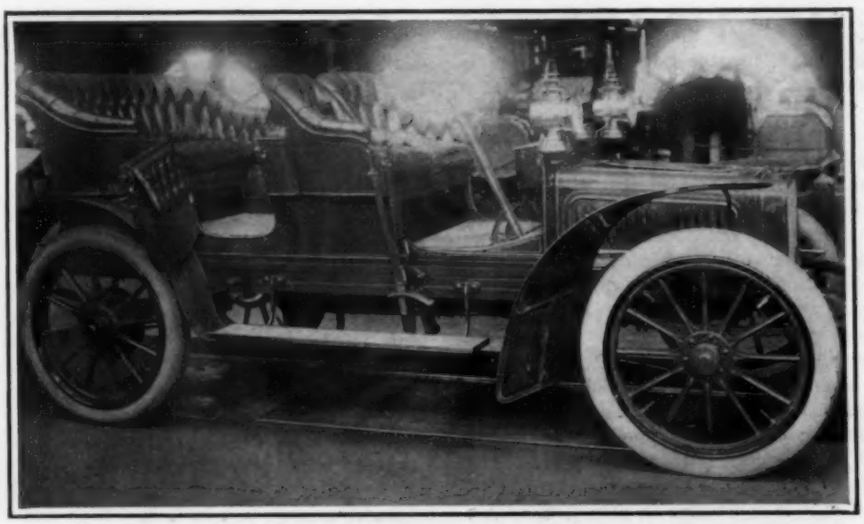
The workmanship of Alfred Belvallette, of Paris, is shown on a Delahaye chassis of 25-32-horsepower, a *Roi des Belges* body with high curved back, wide rear seat and deep individual front seats. With a crimson body and chassis relieved by black moldings, and a large area of crimson leather about the seats, the effect is very rich. There are doors on each side and a victoria top of brown leather is fitted.

A Swiss Double-Phaeton.

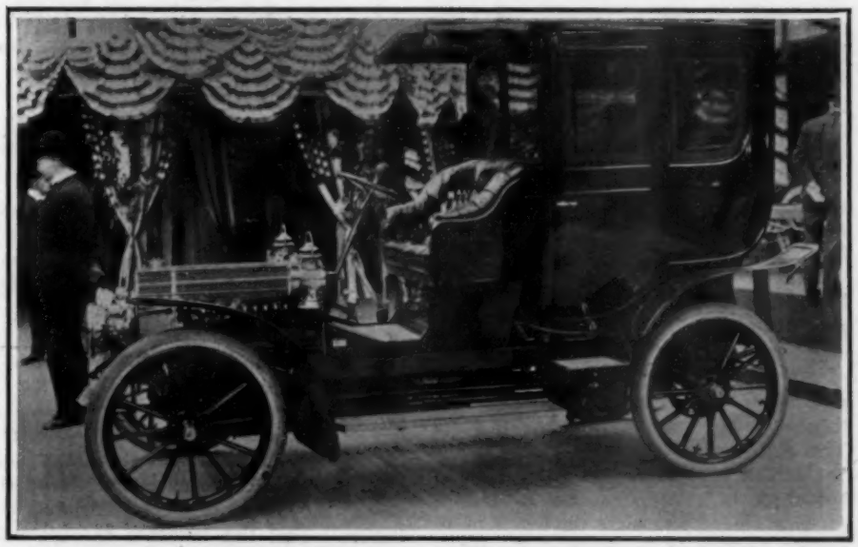
The Martini car shows the work of another foreign firm, C. & R. Geisberger, of Zurich; the 24-horsepower chassis carries a body with high back, wide rear seat, side doors and running-boards with sprocket steps; the individual front seats being equally roomy. The entire car is finished in olive green with black moldings and yellow stripe; the upholstery being in green leather.

The Clement-Bayard phaeton, with 20-horsepower motor is from the Botiaux shops, and is finished in olive green, with light green stripe, and fitted with extension hood of brown canvas.

The Leon Bollee phaeton, on a 30-horsepower chassis, has a body by Labourdette, of Paris, with square back, finished in dark green, the upper panels relieved by vertical red stripes, with vermilion chassis. The entrance is peculiar, on each side is a swivel seat and door, the movable part of the seat being quadrant-shaped; as the front seat is in a single width, two persons sitting on it may move over to permit the opening of either door without dismounting.



QUINBY SIDE ENTRANCE DOUBLE PHAETON ON DECAUVILLE CHASSIS.



ROI DES BELGES DOUBLE PHAETON SIDE ENTRANCE BODY BY SUET FRERES.

Running-boards and sprocket steps give easy access to the door opening.

A Mors 24-32 chassis is fitted with a Rothschild body, finished in claret with black moldings and light red stripe, the chassis and wheels being of carmine; the upholstery is in claret-colored leather. Running-boards of iron lead to the side doors, and there is one wide rear seat. A large flap with pockets of different sizes is hung from the rear of the driver's seat. A movable touring top is fitted with aluminum sides and large glass panel in back and a glass to protect the driver. There are side curtains, luggage rack, and a trunk rack at the rear.

A handsome Rothschild body is seen on a F.I.A.T. chassis, of the *Roi des Belges* type, with swivel seat, running-board and sprocket step on near side only; the body finished in a bright red with a blue stripe and the upholstery being in crimson leather. A victoria top of black leather is lined throughout with light brown whipcord.

Another F.I.A.T. chassis has a body in white with carmine stripe lined with bluish gray leather, and chassis and wheels being dark red. There are doors and running-boards, with sprocket steps on each side. There is ample room on the rear seat and in the body, and an extra seat is fitted. Luggage boxes are attached to the sides.

The Rear-Door Tonneaus.

The most imposing of the rear-door tonneaus is a Quinby body mounted on a 24-horsepower Panhard chassis, both finished in blue with black moldings and white stripe; the upholstery in black leather. A touring top with movable glass front and back is fitted.

A very beautiful piece of work is shown by the Quinby Company in the rear-entrance tonneau of a F.I.A.T. car; an aluminum tool-box being shown in place on the car while the tonneau is detached. The lines of the semiracing body, with individual seats an' tool-box, are very stylish, and the *Roi des Belges* tonneau is equally well modeled. The color of the entire car is a delicate pearl gray, with maroon leather upholstery. The appearance is improved by the graceful sweep of the wide fenders. Not the least important part of the work is the perfection of the finished surface of enamel over the aluminum.

The only Napier car shown has a body by the Regent Carriage Co., Ltd., of London, a rear-door tonneau, with movable touring top, with glass panels in the back, glass door over the main door, and glass side panels. A glass panel in the rear of the driver, and another in front, slide in metal guides and swing up under the roof. The body is quite handsome, finished in light green, with black moldings and white stripe, the upholstery being in red leather. The motor is of 15-18-horsepower.

With the possible exception of some brilliant reds which are certainly warranted by conventional usage in automobiles, the finish of the cars is notably quiet and in good taste, and as a rule there are no glaring nor discordant colors.

GORDON BENNETT ENGLISH ENTRIES.

Special Correspondence.

Liverpool, Jan. 7.—Entries for the Gordon Bennett race for 1905, closed with the Automobile Club of Great Britain on December 31. Following is the official list:

Four Napier cars, entered by S. F. Edge; two Wolseleys, entered by the Wolseley Co.; a Siddeley, entered by Lionel de Rothschild; two Stars, entered by the Star Co., and a Darracq entered by the English Darracq Co.

The Napiers will all be of the six-cylinder type, and will be driven by Cecil Edge, John Hargreaves, Clifford Earp and Arthur McDonald. The Wolselevs will be in the hands of Jarrot and Girling, while Lionel de Rothschild will probably drive the Siddeley. The drivers of the Star cars are not yet determined; but either A. Rawlinson or L. Guiness will run the Darracq, which is one of the Glaswog-built models which ran in the last English eliminating trials.

Full details of the cars are not yet known, but it may be taken for granted that all the above makers will turn out fine pieces of workmanship and an interesting and exciting struggle will certainly take place on the Isle of Man in May next when the eliminating trials are held.

His car left a gasoline trail,
So he feared that his tank was too frail.
With a match for a light
He found he was right;
And they gathered him up in a pail.

COUPE BY BURR & CO., ON BRASIER CHASSIS.

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The American Show

The collection of automobiles now on exhibition in Madison Square Garden, is as a whole, a pleasing surprise even to those who have watched the development of the industry, and who are familiar with the perfection of certain specific makes of cars. As compared with previous years, the present show discloses a remarkable elevation of the standard of design and workmanship in all classes of cars. The best of 1905 are but little better than a limited number of the 1904 cars, but the exhibit as a whole, including cars of every price, from lowest to highest, is on a new and far higher plane.

As an index of the popular demand as interpreted by the makers, the show disclosed certain broad tendencies in design and construction. The question of speed is in abeyance. There are cars of high speed in plenty, but the main effort has been to produce the most reliable and comfortable capable of maintaining average speed not in excess of the legal limits. This is shown particularly in the very large number of four-passenger touring cars of twenty horsepower and under, in which roominess, easy riding, and all-around reliability are given the first place. No previous show has ever approached the present one in the wide range of choice which is offered to the user who owns but one car, driving it and probably caring for it himself. The plain runabout and its sister car, convertible to carry two extra passengers on occasion, are supplanted by a really fine class of four-passenger touring cars, many being offered at very low prices.

On the mechanical side there are evidences of a material advance in general design, perfection of detail and fitting and finish of parts. There is a grateful absence of novelty for its own sake, most makers being content to accept as standard the general type established by the leading foreign cars and to reproduce this general form of motor, transmission, chassis and body, modified to meet American conditions, in the best way possible for the selling price. The American type of horizontal motor has neither been abandoned nor neglected, but there is evident, on every hand, a growing tendency to place the motor in an upright position in the front of the car.

Even admitting that the foreign type does not represent perfection, and is still capable of great improvement, it is manifest that the concentration of the efforts of the makers and the interest of the users upon one type, generally accepted as satisfactory, must have a wholesome steadying effect upon the industry.

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Study of the Carbureter.

One of the hopeful signs of the times to the users of automobiles is the concentration of effort on the part of designers and builders upon details, there being, for the time at least, a common agreement upon proportions and general principles of automobile construction. In this movement the carbureter—the lungs of the automobile—is attracting a generous share of attention, and is being constantly improved in the vital details of added efficiency and economy with the standard fuel—gasoline—and adaptability to the use of other fuels.

The descriptions of two of the latest foreign carbureters, as published in recent issues of THE AUTOMOBILE, are interesting, because of their mechanical details as well as from their high reputations, but beyond this they possess a far higher value. In both cases the inventors have not been content to start with one of the accepted types, limiting their work merely to alterations of the mechanical details; on the contrary, they have based their work on the initial principles of gasification, carburation and the flow of gasses. Looking first to the physical and chemical principles, they have built up on this foundation certain theories which they have finally embodied in concrete and material form in the perfected apparatus.

The theories themselves are essentially French in their nature—delicate, fine spun and elaborate—it may even be that they are incorrect, or, if not, that they are not capable of direct practical application; nevertheless they are well worth the study of all who are interested in the subject of the carbureter. In view of the prevailing tendency of modern invention, especially in this country, to seek for direct and immediate practical results, often overlooking the preliminary and intermediate steps, a greater attention to the purely theoretical side may not be a waste of time in the end.

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New York Show Situation

The change in the management of the New York Show, which has been the principal topic of discussion for the past week at the Garden, is but a step in an evolution whose ultimate end it is still impossible to foretell. From the remote and comparatively insignificant beginning of the Selden patent there has grown up a large and powerful organization, representing a great proportion of the brains and money of the American automobile industry; at the present time the dominating influence. That this influence has operated strongly for the general good in many ways, is recognized by many; but it is quite evident that the Association of Licensed Automobile Manufacturers is possessed of a power which may readily be abused in the interests of its members as opposed to those of all other manufacturers. At this time, when so little is known of the intentions of the Association in carrying out the new policy of action of which this last move is but a detail, it would be idle to attempt to discuss the many phases of the subject.

The one point that is of direct and immediate interest is the possible clearing up of the very unsatisfactory situation now existing in regard to the great annual show. While possibly working a hardship to some, the action of the Association in taking to itself exclusively the Garden and the Show may be the cutting of the present Gordian knot.

It is evident that such shows as the present, while national in character, cannot be satisfactory, to either exhibitors or spectators. The hall is so inadequate in size and general facilities that the number of exhibitors is necessarily limited. Those who are fortunate enough to get in are restricted to spaces too small for a proper display of their cars, and the general crowding of aisles and stands interferes with all business, whether with dealers or individual buyers.

With the Show management concentrated in the hands of a powerful association, and with the list of Exhibitors restricted to its membership, the full possibilities of the Madison Square Garden, such as they are, should be realized, and the exhibition should be raised to a far higher plane. It is probable that the Association would, for its own sake, brighten up the surroundings and inaugurate some artistic scheme of general decoration for the building itself and for the individual stand, after the plan adopted with such success at the Importers' Salon. All the details of the Show might be similarly improved by liberal, intelligent and capable management, under a single head. Such a change would be welcomed alike by

exhibitors and their attachés and the general public.

That such a show would not be truly national, goes as a matter of course. Many very good cars would doubtless be excluded from its walls; but, as far as its limits extended, it might be made greatly superior to the previous and present exhibitions. So far as the outside manufacturers are concerned, we do not understand that the Association has any monopoly of the Garden, and doubtless they will take care that their trade does not suffer for lack of a representative annual exhibition. It has been suggested that they join hands with the importers in making a great international display.

OBNOXIOUS AUTO BILLS.

Proposed Tennessee Law Requires Owner to File $3,000 Indemnity Bond.

Special Correspondence.

NASHVILLE, Jan. 16.—A bill introduced in the Tennessee Legislature last week has aroused the indignation of motor car owners all over the state, and a strong fight will be made against it. The bill provides that every owner must make a solvent bond of $3,000, before the court of his county, this to be an indemnity against injury to the public. The owner is made responsible for every accident in which his car is involved, whether or not he is driving the car. It further provides that state numbers shall be issued in addition to the numbers used in the cities having a numbering ordinance, and that cars shall be licensed at $2 each, the license to be renewed whenever the car changes owners.

A bill introduced the week before was even more offensive, and it has since been withdrawn. It provided that cars be prohibited from running on the public highways of the state and from every city with a population not more than 9,000. This would exclude the automobile from all but eight towns in Tennessee. Another bill which is being considered, calls for a state speed limit of fifteen miles an hour.

INTERSTATE RECOGNITION OF TAGS

Special Correspondence.

PHILADELPHIA, Jan. 16.—Many members of the Automobile Club of Philadelphia are interested in a project to have introduced into the Pennsylvania Legistlature, at its present session, an amendment to the automobile law which will allow tourists from other states, who desire to travel through Pennsylvania in their cars, to do so without being compelled to secure a Pennsylvania tag. This measure will, of course, be reciprocal. Should Pennsylvania, for instance, agree to honor New York tags, it is expected that the Empire State will respect Pennsylvania tags. Advocates of the measure hope in this way to make an entering wedge for a Federal law, which will not only result in a national licensing arrangement, but will bring uniformity in the many other matters which now tend to confuse and annoy the automobilist who ventures beyond the confines of his own state.

In making packed joints, it is well to bear in bind that the thinner the packing material the better the joint and the less the possibility of its blowing out, if subjected to pressure.

CHARGE OF UNFAITHFULNESS RULED OUT.

Resolution Discharging Members of Executive Committee for Allowing Licensed Association to Secure Lease of Madison Square Garden Offered at N. A. A. M. Annual Meeting—Ticket of Licensed Members Elected.

There was a short, sharp skirmish at the annual meeting of the National Association of Automobile Manufacturers held in New York on Wednesday, January 18, when George W. Bennett, of Thomas B. Jeffery & Co., an unlicensed or "independent" concern, attempted to introduce a resolution discharging a majority of the show committee for "unfaithfulness in the trust reposed in them." Mr. Bennett asked President Windsor T. White, at the conclusion of his report, if the members of the show committee had been aware of the plan of the licensed association to lease the Madison Square Garden for future shows and received an affirmative reply. Mr. Bennett then expressed his intention of introducing a resolution, but was promptly checked by the president on a question of order, the business of the meeting being the election of new members to the executive committee. The election then proceeded.

A ticket was nominated by the unlicensed members, consisting of Charles E. Duryea, of the Duryea Power Co.; J. S. Bretz, of the Corbin Motor Vehicle Corporation; James Couzens, of the Ford Motor Co.; Thomas Hay, of the National Motor Vehicle Co.; and E. B. Schirmer, of the Royal Motor Car Co. Representatives of licensed companies nominated S. T. Davis, Jr., of the Locomobile Co. of America; Charles Clifton, of the George N. Pierce Co.; S. D. Waldon, of the Packard Motor Car Co.; R. B. Chapin, of the Olds Motor Works; and L. H. Kittridge, of the Peerless Motor Car Co. A vote resulted in favor of the latter ticket, the count standing 27 to 11. Consequently the next executive committee will consist of 11 members from licensed members, 11 unlicensed members, two representatives of steam car builders and one electric man. The executive committee will elect officers at a meeting to be held Saturday, January 21.

Treasurer Innes reported a balance of $10,300 in the treasury. The executive committee made an appropriation of $500 toward the Brownlow good roads bill fund.

President White, in his report, briefly reviewed the year's work, touching on the most important occurrences. The association had been strengthened, he said, by the accession of nine new active members, while five active and eight associate members had resigned. In reference to the allotment of show space, he said that he considered the fact that complaints regarding inadequacy of space were universal proof that the distribution had been impartial. As the contract with the Automobile Club of America and the Madison Square Garden Company closed with the present show, it was believed that plans being considered by the executive committee would lead to more satisfactory arrangements for another exhibition. Reference was made to the withholding of sanctions from numerous small shows, which threatened to split up the exhibits to the detriment of the larger shows; to the work of the freight rate committee, which was unsuccessful in securing a reduction of rates and developing the fact that an increase in western rates was threatened, against which steps were being taken; to the inquiry into the legality of automobile licensing; to the automobile exhibit at St. Louis; to the matter of road improvements, in which a more active part was being taken than heretofore; to the very satisfactory financial condition of the association; and lastly, with regret, to the death of Frank Sanger, late manager of the Madison Square Garden Company.

Business worries and sharp competition were forgotten at the vaudeville entertainment and smoker given by the National Association of Automobile Manufacturers, at the Waldorf-Astoria, New York, on Tuesday evening, January 17. An attractive program of musical and other specialties was carried out, and this was supplemented by "smokes" and liquid and solid refreshments.

Speculation regarding the New York Automobile Show in 1906, and subsequently, was given an abrupt turn by the announcement Tuesday, that the Association of Licensed Automobile Manufacturers had leased Madison Square Garden for 1906 and 1907, with the option of renewing the lease for two years more. According to the terms of the lease, the allotment of space is placed in the hands of the Association. In other words, the A. L. A. M. proposes to assume complete control of the New York Automobile Show for some time to come. The final decision to sign the lease for the Garden was reached during the course of the annual meeting of the board of managers of the Association, held on Tuesday, January 17. The members were reported as being unanimously and enthusiastically in favor of the plan.

Officers of the A. L. A. M. state that this action is the natural consequence of the feeling of discontent existing among a number of the larger and more important manufacturers, because of the inadequacy of the space allowed for their exhibits. Shows held under the control of the A. L. A. M. would embrace only vehicles made by members of the Association, and manufacturers and agents whose machines do not infringe the Selden patents, such as electric vehicles and steam cars. It is stated, however, that the show will be virtually open to any manufacturer of repute, "as he will only have to join the Association to secure space." As only manufacturers of irreproachable standing, and whose product is reliable would be admitted, the fact that a machine was on exhibition would be a guarantee of its excellence, it is argued. This the members of the Association consider the most important result of the new arrangement, being of even greater moment than the increased space allowance.

While the outside or unlicensed manufacturers profess their indifference to anything the Selden patent licensees may do, there is considerable discussion as to how they will be affected by the change. On the surface the general feeling seems to be that they are well able to stand on their own feet, and as long as they can sell all the cars they make, as many state they do, they cannot be seriously affected by the action of the A. L. A. M. This refers to the larger manufacturers and those who are already well established. The feeling of security is less marked among the less powerful independents, for many of them cannot but feel that their exclusion is one of the objects aimed at by the Association. That this feeling is not without cause, is shown by the remarks of an officer of the Association. "As it is now," he said, "any man who has built a machine and hurried on a coat of pain just in time for the show, can exhibit and induce people to place orders or buy stock and so on, whether his machine is any good or not. It may be all right, and it may be all

wrong; the visitor, if not posted, may be taken in by a worthless affair handled by an unscrupulous exhibitor, if he has not the necessary knowledge as a safeguard. At shows held under the auspices of our association, however, the prospective purchaser need not worry himself concerning the standing of the exhibitor, for he knows that, as a member of the Association, the exhibitor must be a solid business man and a producer of honest and meritorious goods This is the point we wish to emphasize most strongly. Our object is not to assume control of the automobile business as a trust, but to safeguard the industry by excluding unworthy schemers."

George W. Bennett seemed very unconcerned when asked for a statement as to his company's position in the matter. "You may say for us," he said, "that we are giving no consideration, whatever, to the show question. Of course, there is a great deal being said about rival organizations, plans for future independent shows and so on, but we are not at all interested. We are going right ahead minding our own business, which is manufacturing and selling automobiles, and believe that will keep us sufficiently busy."

An officer of the National Motor Vehicle Co. expressed the belief that the new arrangement would either kill the New York show or force concerted action on the part of the "outside" manufacturers and agents, which would be disastrous to shows held by the licensed association. "Have the licensed men a 'cinch' on the Garden all the year around?" he asked, "and are there not other places in the city where a show could be held on a pinch? And, for that matter, is New York the only city where a big show can be held? Supposing the plans of the licensed association are carried out, it would not surprise me if the New York show degenerated into a purely local affair and the national show was held in Chicago. How much of a show would the licensed manufacturers make by themselves in this big garden? They would have all the room they wanted, wouldn't they? Of course, their show would be very dignified and would doubtless be a society affair to a great extent; but the kind of a show the crowds turn to see, is a show where they can find everything that is new, and as for the freaks—well, everyone knows how the crowds love freaks. The people won't turn out if they know exactly what they are going to see; it's all cut and dried beforehand; they want a spice of something unusual to liven things up. No, I don't believe the outsiders are going to suffer much from a show point of view. I can't figure it that way at all."

TORONTO SHOW ABANDONED.

Promoters Fail to Secure Suitable Hall—Individual Exhibit by Agents.

Special Correspondence.

TORONTO, Jan. 16.—The automobile show which was to have been held here from February 27 to March 4 has been declared off on account of failure to secure a suitable hall for the purpose. Toronto automobilists are naturally much disappointed, as it was thought the show would have done much to popularize motoring here. About fifty of them, however, left last night to attend the New York Automobile Show, and it is expected that they will bring back some new ideas, and perhaps leave orders for some cars.

The Canada Cycle & Motor Co., which inaugurated the event last year, has announced that it will again hold an automobile show of its own at its garage and showrooms in February. This event was very successful last year, being attended largely by the society people of Toronto, and the company intends to make even more extensive preparations, in the way of decorations, lighting and music this year. The company is agent for the Pope, Packard, Peerless, Ford, Stevens-Duryea, Mitchell and Autocar.

TALKING CHICAGO SHOW.

Picture Gallery May Be a Novel Feature at Coliseum.

Special Correspondence.

CHICAGO, Jan 16.—The Chicago Automobile Show, which will open in the Coliseum February 4, is the one topic that is occupying the attention of the automobilists in the shops and those who sit in the comfortable chairs in the Michigan avenue clubhouse. Many of the club members are in New York attending the Madison Square exhibition. Those who have remained behind are steadfast that "everything that you can see in New York you can see in the Chicago show—and more."

One of the novel features that is being planned is a picture gallery in which many of the prominent motorists and pioneer automobiles will be shown. A panoramic view will also probably be presented showing an automobile road race. If this plan can be carried out a number of panels will be extended about the picture gallery. The panorama painted by Jean Paleologue, the Paris poster painter, for the Importers' Salon, will also be exhibited.

Among those who have accepted invitations to be present are Sir Thomas Dewar, who will come directly from Florida after the races at Ormond beach, and Walter Christie, of New York, who has promised to exhibit his racing machine.

John Farson, president of the Chicago Automobile Club, sent the following telegram from the New York show to friends in Chicago:

"NEW YORK, Jan. 14.—The automobile exhibition has opened in a particularly brilliant manner, both from the society standpoint and as showing the wonderful development of American machines in the last year. It is generally conceded that the American machines are much better suited to our roads than the foreign makes and our manufacturers are rapidly approaching the foreigners in beauty of design and character of workmanship. I am much pleased at Governor Deneen's position on the good roads question. Good roads are the greatest need of the country to-day.

"JOHN FARSON,
"President Chicago Automobile Club."

LOCAL SHOW IN SYRACUSE.

Special Correspondence.

SYRACUSE, Jan. 16.—Local dealers and members of the Automobile Club of Syracuse have decided to hold a joint automobile show in the Alhambra during the first week of February and have applied to the National Association of Automobile Manufacturers for a sanction. An association has been formed for the purpose with C. L. Amos, president; R. M. Cornwell, first vice-president; W. B. Bissell, second vice-president; M. C. Blackman, secretary; Harry L. Pierce, treasurer.

Among the local firms interested in the project are the Amos-Pieree Company, the Syracuse Motor Car Company, the R. M. Cornwell Company and M. C. Blackman & Company. The automobile club has also taken up the matter with enthusiasm and it is believed that exhibits of many of the country's leading manufacturers can be obtained for the Syracuse show.

NEW YORK MOTOR CLUB BANQUET.

The banquet of the New York Motor Club, held in the grand ballroom of the Hotel Astor, New York, on Sunday evening, January 15, proved to be a genuinely pleasant affair for all the guests. Informality was the order of the evening, and the lack of set forms was thoroughly appreciated. About 250 persons were present, and were welcomed upon their arrival by President Hyde. Among the invited guests were no less than forty manufacturers of automobiles. President Hyde introduced Sir Thomas Dewar, the guest of honor, and presented him with the first club badge struck from the official dies, at the same time announcing his election to honorary membership—the first to be so elected. Sir Thomas' informal reply kept the company in roars of laughter. After the banquet the guests were entertained by a number of variety performers. The affair had been looked forward to with much interest, owing to its being the first important entertainment given by the rapidly rising club; and the result is decidedly pleasing to the club members, who have been warmly congratulated on the success of their first attempt.

HYATT BANQUET AT BRETTON HALL.

The third annual banquet of the Hyatt Roller Bearing Co., of Harrison, N. J., was held at Bretton Hall, New York, on Wednesday evening, January 18, there being about 100 guests present, the members of the concern and their friends. The guests were greeted by Alfred P. Sloane, while Meredith Leitch occupied the position of toastmaster. There were no set speeches; but instead, many good stories were told, and fun reigned. Not the least interesting feature of the occasion was the program and menu, which the guests kept as a souvenir of the feast. Ices were served in paper imitations of Hyatt rollers.

RECKLESS CHAUFFEURS ARRESTED.

As usual during Show week, the police were very active, and a large number of drivers were arrested. Among those arrested was Henry Fournier, who was stopped at Fifty-ninth street and Fifth avenue on Monday while demonstrating a car for a prospective customer, and was fined $10 by Magistrate Whitman, in the Yorkville Police Court. Maurice F. Brunn, a chauffeur for R. E. Jarridge, of the De Dietrich Co., was arrested on the evening of the same day, after a chase along Broadway and across Thirty-fourth street to the De Dietrich garage opposite the Waldorf-Astoria. In the Jefferson Market Court, on Tuesday, Bicycle Policeman Casey, who made the arrest, charged that Brunn had intentionally crowded him into the curb and knocked him from his wheel. Brunn was held in $2,000 bail by Magistrate Ommen, on charges of felonious assault and fast driving. Magistrate Ommen received a letter from President Dave H. Morris, of the Automobile Club of America, requesting that Brunn be severely punished in case the charges against him were found to be true.

When Mr. Jarrige heard of his chauffeur's arrest he went to the police station, intending to give bail for him; but upon learning the facts of the case he left without making the necessary deposit. Mr. Jarrige's action has been most favorably

commented upon as indicating a desire to assist in checking lawlessness among chauffeurs. W. W. Niles, counsel for the Automobile Club of America, wrote to District Attorney Jerome, offering his professional services, as the club's attorney, in prosecuting Brunn. Automobilists generally are of the opinion that the chauffeur will deserve all he gets.

RHODE ISLAND CLUB DINNER.

Novel Table Decorations and Interesting Addresses at Annual Meeting.

Special Correspondence.

PROVIDENCE, R. I., Jan. 14.—The annual meeting of the Rhode Island Automobile Club last week was the most notable event in the history of the club. The guests included some of the most prominent personages in automobile circles in the country and the dinner at the Wellington was followed by the brightest of speeches.

The following officers were elected for the ensuing year: President, Dr. Julian A. Chase; First Vice-President, W. Penn Mather; second vice-president, Darwin Almy; treasurer, Howard D. Wilcox; secretary, Elliot Flint; governors, to serve until 1908, Charles O. Read, Darwin Almy. Several amendments to the constitution and the by-laws were adopted.

After the election the club adjourned to the banquet. The president's table was arranged in semi-circle form, with trailing vines forming a miniature race track along its edge. At one end was a miniature automobile occupied by a party of dolls and at the other a gateway over which gazed a horse wrapped in blankets. The quadruped wore a disconsolate expression and a large placard bearing the inscription, "The passing of the horse," gave the reason for the melancholy look. A profusion of vari-colored electric light bulbs sent their bright rays outward and spread over the table a gay color.

After the last course the members were called to order by President Chase, who congratulated the club on its prosperity during the year and introduced President Harlan W. Whipple, of the American Automobile Association, who spoke briefly on the work of the organization. A letter of regret was read from President Dave H. Morris, of the Automobile Club of America, the presence of a son in his home, born on Christmas day, preventing him from being present. As a mark of regard, the Rhode Island Club drank to the health of the latest addition to the ranks.

In an interesting address A. R. Pardington, chairman of the American Automobile Association racing board, told of the difficulties the board had encountered.

Augustus Post, chairman of the touring committee A. A. A., spoke of the beneficial effects the St. Louis tour had upon the sport in the States and predicted the coming year to be one of touring. President Asa Goddard, of the Worcester Automobile Club, also delivered an interesting address.

Commercial travellers, who are particularly well able to pass upon the merits of transportation methods from a business standpoint, are taking very kindly to the automobile.

The automobile, in the form of a small house on wheels, ought to become popular in the near future as a "land cruiser." The automobile voyager could migrate to warmer climates in winter, and so keep his craft in commission all the year round, as is sometimes done by yachtsmen.

ANNUAL MEETING AND ELECTION OF THE A.A.A.

President Whipple and Other Officers Re-elected. W. C. Temple Succeeds A. R. Pardington as Racing Board Chairman. Records for Intermediate Miles Rejected. Forty-one Clubs Now Members.

President Harlan W. Whipple, of the American Automobile Association, and the other officers who served during 1904 were unanimously re-elected at the annual meeting of the Association held in New York city on Monday, January 16, the regularly nominated ticket meeting with no opposition. A. R. Pardington having declined re-nomination as chairman of the Racing Board, William C. Temple, of the Pittsburg Automobile Club, was appointed to fill the vacancy. The other members of the racing board for 1905 are, W. K. Vanderbilt, Jr., T. M. Hilliard and George I. Scott, of New York; H. L. Bowden and William Wallace, of Boston; George L. Weiss, of Cleveland; F. C. Donald, of Chicago; R. L. Lippitt, of Providence, and E. H. R. Green, of Dallas, Texas. A. L. Riker, E. T. Birdsall and Rollin T. White are technical advisers.

In making its report, the retiring racing board announced the rejection of intermediate records made during the past year, and the acceptance of Oldfield's time of 53 seconds, made at Los Angeles, on December 21, as the official record for one mile. Other accepted figures were Oldfield's time of 2:39 4-5 for three miles, 8:04 for nine miles, and 1:12:40 3-5 for fifty miles. The new board was recommended to accept as a record, the 100-mile run made by E. H. R. Green at Dallas, Texas, and was further recommended to follow the action of the 1904 board in the rejection of intermediate times as records.

The number of clubs belonging to the American Automobile Association, was reported as forty-one, with a total individual membership of 4,000, in addition to which there are 400 individual members who do not belong to clubs.

Folowing is a complete list of the officers for 1905:

President, Harlan W. Whipple, A. C. of America and A. C. of New Jersey; first vice-president, John Farson, Chicago A. C.; second vice-president, Judge William H. Hotchkiss, president New York State Association of Automobile Clubs; third vice-president, Dr. Millbank Johnson, Los Angeles A. C.; secretary, C. H. Gillette, A. C. of America; treasurer, George E. Farrington, president A. C. of New Jersey; directors, Elliott C. Lee, Massachusetts A. C.; William C. Temple, Pittsburg A. C.; Dave H. Morris, A. C. of America; A. R. Pardington, Long Island A. C.; R. L. Lippitt, Rhode Island A. C.; Windsor T. White, Cleveland A. C.; E. M. Steck, Florida East Coast A. A.

Albert R. Shattuck is chairman of the Good Roads Committee; Augustus Post of the Touring Committee, and James B. Dill of the Law Committee.

Sir Thomas Dewar, of England, and Mayor McClellan, of New York, were among the prominent guests at the annual banquet of the American Automobile Association held at the Waldorf-Astoria, Monday evening, January 16, following the business meeting, which was held in the afternoon. President Harlan W. Whipple presided, and addresses were made by a number of prominent automobilists, including Sir Thomas Dewar, Mayor McClellan, of New York; Winthrop E. Scarritt, Dave H. Morris, and others.

SYRACUSE CLUB ELECTION.

Special Correspondence.

SYRACUSE, Jan. 16.—Willet L. Brown was re-elected president of the Automobile Club of Syracuse at the annual meeting held January 9. Giles H. Stilwell was elected first vice-president, George S. Larrabee second vice-president and Forman Wilkinson secretary and treasurer. Messrs. Stilwell and Wilkinson are now holding offices in the club for the first time, although both have long been connected with it and are enthusiastic workers.

Frederick H. Eliott, the retiring secretary-treasurer, is one of the five charter members of the club and has held the offices named since the club's formation. Upon his retirement he was elected a director from the club to the directorate of the American Automobile Association.

New members to the club were elected as follows: Ames Howlett, Howard K. Brown, Henry K. Chadwick, H. M. Chase, W. O. Conger, F. Z. Wilcox, Loyal G. C. Tabor, W. B. Sherwood and F. L. Weightman.

Reports of the various officers showed the club to be flourishing in finances and otherwise, so that it is ready for a year of work and advancement.

NOTES OF THE CLUBS.

KANSAS CITY.—Roy Sanborn, who has been selected by the Automobile Club to get new members, reports that he has secured twenty already. This brings the membership of the club up to sixty. As there are about 350 cars in the city, there is still room for missionary work.

PHILADELPHIA.—Eight new members were admitted to membership at the last meeting of the A. C. of Philadelphia, bringing the total in the neighborhood of 200. W. C. Kelsley, a member of the club, is promoting a hare-and-hounds chase by automobile, open only to club members. Sydney E. Hutchinson, a prominent member of the club, will leave soon for an automobile tour abroad. He will use his own car, and until spring will confine his journeyings to Southern France and Italy. Mrs. Hutchinson will accompany him.

PHILADELPHIA.—At the annual meeting of the Philadelphia Motor Cycle Club, held at its club-house, on North Broad street, last Thursday evening, the following officers were elected to serve during the year 1905: President, T. J. Kean; vice-president, A. Wicknick; secretary-treasurer, Charles Krauss; captain, Hugh Shaw; first lieutenant, Frank Shaw; second lieutenant, Alex. Klein; color-bearer, John Benders. Half a dozen applications for membership were favorably acted upon, and a plan was discussed for bringing into the fold every motorcyclist in the Quaker City. A banquet formed a fitting finale to the meeting.

MOBILE, ALA.—Nine new members were admitted by the Mobile A. C. at a meeting held the first week in January. Many additional applications are expected in the near future. The Mobile club is one of the most flourishing in the South. On the club roster are a number of prominent officials, and with their aid a good winning fight is to be made for road improvement, which is the main hobby of the organization. About thirty-five cars are owned in Mobile, and there is a first class garage and several agencies. A number of enjoyable club runs have been held. The officers of the club are: J. W. Whiting, president; Robert C. Morris, vice-president; John A. Mahon, secretary, and John Shearer, treasurer.

TWO AUTO BILLS PENDING IN MICHIGAN.

Comprehensive Holmes Bill Requires Licensing of Cars and Chauffeurs and Fixes Speed Limits but Allows Local Authorities to Fix Minimum Speed.

Special Correspondence.

DETROIT, Jan. 16.—The Michigan legislature now in session at Lansing is getting in line with other states that have "automobile bills" and last week saw the introduction of two bills dealing with the automobile. It is a noteworthy fact that these bills rarely emanate from the cities. They come from the country districts and are designed in great part for the protection of the farmer.

The most important of the two Michigan bills was introduced by Representative Holmes, of Gratiot county, "to regulate the use of motor vehicles on the public highways." The bill contains many provisions to protect farmers from having their livestock frightened by automobiles. It proposes to regulate autos also in the cities of the state. The bill, if it becomes a law (which is very likely), will compel every owner of an automobile and every chauffeur to register at the secretary of state's office, who shall on the receipt of $2 issue a number to be conspicuously displayed on the machine. Each chauffeur must pay $2 for a license, and will receive a badge two inches in diameter to be conspicuously displayed on his outer clothing while he is operating his machine. It also requires every man registering—whether owner or chauffeur—to declare what kind of a machine he is competent to run. The double precaution of numbering the machine and driver is taken so that identification will be easier in case of accident.

The speed limit is fixed at fifteen miles an hour on country roads, ten miles an hour in the residence portion of cities, and six miles an hour in the business districts of cities. To local authorities is reserved the right to pass automobile ordinances of their own provided the speed limits do not exceed those in the proposed law.

The bill provides penalties for infraction of its provisions and in case of accident due to violations the injured person may recover damages. Violations are punishable by a fine of not more than $50 for the first offense; not less than $50 and not more than $100 for the second offense; and not less than $100 and not more than $200 for the third offense.

One of the interesting provisions of the bill is that, if on the street or road the driver of a motor car sees that a horse shows signs of being frightened, he must come to a full stop and remain so until the danger is past. Should this bill become a law, it would probably supersede the city ordinance now in force in Detroit.

Senator Russell, of Kent county, introduced the other automobile bill, which merely provides for a state system of numbering, and as the Holmes bill includes this provision, it is likely that the Russell bill will not get by the committee.

PARK SPEED REGULATIONS UPHELD.

Special Correspondence.

BOSTON, Jan. 9.—An important decision regarding the rights of automobilists on park roads of the Commonwealth, has just been handed down by the full bench of the Massachusetts Supreme Court, in the case of the Commonwealth against Francis B. Crowninshield, of this city.

Mr. Crowninshield was convicted in the lower court of driving an automobile on Commonwealth avenue, Boston, in excess of the rate of speed established by the Boston park commissioners, which is eight miles an hour. Mr. Crowninshield claimed that while his machine might have been going faster than eight miles an hour, it was not making greater speed than that permitted by the general statute of 1902, governing the speed of automobiles on the highways of the State. The point before the Supreme Court was whether park boards have a right to make speed regulations differing from those prescribed by general law.

The Supreme Court holds that the park boards have such power, and Mr. Crowninshield's exceptions are overruled, the court holding that the automobile statute does not take away from local park boards the right to limit the speed of vehicles on park roads and boulevards. The court also holds that the park board regulation is binding, though no notice of the rule was posted conspicuously, at points where it applies. The Act of 1903, requiring such posting, is not held to apply except in cases of special regulations made by aldermen of cities and selectmen of towns. The court defines the term "driving an automobile," by saying that a person is driving if he controls the motive power.

AIMED AT INCOMPETENTS.

Philadelphia Chauffeurs Would Have Licenses Refused to Drivers Under Age.

Special Correspondence.

PHILADELPHIA, Jan. 16.—Local chauffeurs who recently organized the Chauffeurs' Association of America, for the protection of their interests and with social objects in view, have started a movement to prevent incompetent operators from obtaining licenses. They want a bill passed by the legislature to prohibit any person under twenty-one years of age from being granted a professional operator's license. They also will agitate for the enforcement of the existing law, which provides that before an operator's license is granted the applicant must demonstrate his ability by passing an examination. This examination should be of such a character that, in order to pass, the applicant must have a good knowledge of the mechanism of the automobile. Local chauffeurs claim that too many tyros are breaking into the game, and by their indifferent and inefficient work, have given the whole craft a "black eye."

The Association has headquarters at 1519 Vine street, where it will welcome drivers who visit Philadelphia to attend the local show next week.

The officers of the Association are: President, Frank Bradley; first vice-president, Joseph Dunn; second vice-president, Samuel Rogers; corresponding secretary, Patrick Fitzsimmons; financial secretary, William Latta, and treasurer, Charles Howard.

There is a strong tendency in England, and in London especially, toward the adoption of uniform garage rates.

Multiply the number of volts of a storage battery by the amperes, and you will have the number of watts. Divide the watts by 746 and you have the horsepower. From 20 to 40 per cent. of the energy developed by the battery will be lost in converting it into power in a motor, the remainder being available for use in the form of power.

KANSAS GOOD ROADS BILL.

Provisions of the Montie Bill Modified After Rhode Island Law.

Special Correspondence.

TOPEKA, Jan 13.—J. W. Montie, of Crawford, has introduced into the Kansas legislature the most complete good roads bill that has ever been offered to that body. Mr. Montie, who is a good roads enthusiast, drew the bill with the assistance of the county commissioners of Crawford county, which is rich in coal and oil.

The bill contains parts of the Rhode Island good roads law. Its other provisions are the result of the visit, last summer, of the county commissioners to St. Louis, where they investigated the subject. The measure provides for the appointment by the governor of a state commissioner of public roads, who is to receive a salary of $2,400 per year. It is provided that the man for this place shall be chosen because of his especial fitness and not because of political influence. The duties of the commissioner are enumerated as follows:

To compile statistics relative to the public highways throughout the state and collect information in regard to them; to investigate and determine the methods of constructing and maintaining roads and bridges best adapted to the different sections of the state; to send out to the county commissioners, road overseers and road commissioners practical literature relating to roads and highways; to make tests of rock, filler, binders or other road material sent him for examination by county commissioner; to make quarterly reports, without the use of technical terms, on the various materials submitted to him and on their suitability for road building; to hold, at least once every year, a public road meeting in each county, at which good roads literature is to be distributed and practical lectures or instructions in the building of permanent roads are to be given.

The clause which forbids the use of technical terms by this official is designed to keep the good roads movement a popular one, a feature which is thought essential to its success.

As for actual road work the bill provides that the county commissioners of any county may direct, by resolution, the improvement of a section of any road less than a mile in length by the construction of a macadamized or Telford road. The owners of two-thirds of the lineal feet along the road may petition for and compel the commissioners to make the improvement. The township through which the road runs shall pay 10 per cent. each year on the cost of the road until the entire amount is paid, provided that the cost for road improvements in any county shall not exceed three mills on the assessed valuation, exclusive of the state appropriation for roads apportioned to the county.

If the cost of roads constructed in the state in a year does not exceed $500,000, one-third of the amount shall be paid out of the state treasury if the legislature so provides. The maintenance of the roads is left entirely in the hands of the county commissioners, who are to appoint a supervisor, to work under a bond of $1,000. The commissioners are held responsible for the condition of improved roads.

As the state legislature meets every two years, appropriations under the bill are to be made biennially.

The best automobile lamp ever made, whether gas or oil, will not work satisfactorily unless kept clean.

AUTO INDUSTRIAL GROWTH IN DETROIT.

Capital Invested in Automobile and Parts Manufacture Increased from $500,000 to $4,500,000 in Three Years—Report of Board of Commerce Executive Committee.

Special Correspondence.

DETROIT, Jan. 9.—One of the most earnest supporters of the growth of the automobile industry in Detroit is the Detroit Board of Commerce, representing all the manufacturing and selling interests of the city. Chairman John B. Howarth, of the executive committee, has just had called to his attention the apprehension of certain persons that the board has become over-sanguine of the business possibilities and relative importance of the city. In refutation of this Mr. Howarth has issued a long statement, nearly one-half of which is devoted to consideration of the marvelous growth of the automobile industry in Detroit. While he speaks of manufacturing interests in general, he particularizes on automobile manufacture in a way to make the manufacturers sure that their efforts are appreciated by the city that they have made their basis of operation. Mr .Howarth's remarks should be of interest to the whole country:

"In automobile manufacture Detroit has continued its wonderful development. Up to the end of 1901 this industry was represented in Detroit by a single company with a capital of $500,000. In 1902 two other companies were incorporated, one with $300,000 and the other with $50,000 capital, making the total investment for use in Detroit $600,000. In 1903, by additions to the capital of old companies and the incorporation of new ones, this was increased to $2,200,000. As showing the progressive character of the industry, there was one company organized in February which subscribed capital of $75,000. Lately it increased its capital stock to $400,000. Three other companies which commenced business within the year past have found it necessary to increase their capital. Aside from the companies engaged in the manufacturing and assembling of autos, there are three other large concerns and many other smaller ones, whose industry is directed almost exclusively to the manufacture of automobile engines and other accessories. These concerns added not less than half a million dollars to the capital already actively employed in this industry, making a total of over $4,500,000 invested in the automobile manufacture of Detroit.

"Still another company with a capital of $500,000 has purchased a site for a factory (the Matheson Motor Car Co., being referred to) and will soon remove here from another city. The direct exports of automobiles from Detroit in 1904 were about $150,000.

"The automobile output is valued at not less than $10,000,000. The indirect exports by way of the Atlantic and Pacific seaboard were probably five times that amount. Detroit automobiles have been sent to Mexico, South America, South Africa, New Zealand, Australia and Japan, to every country in Europe, to Turkey, Persia, India, Burmah and almost every country of Asia."

It may also be of interest to automobile manufacturers to hear what Mr. Howarth says concerning the industrial standing of Detroit:

"The variety of the manufactures covered by the companies newly organized here is almost as great as the number of companies formed, being thus in keeping with the drift of Detroit industries towards specialized industry and diversity of product. In the four years since the United States census of 1900, the capital employed in Detroit increased 26.2 per cent.; the amount paid in wages 20.7 per cent.; the cost of materials 26.6 per cent.; and the value of manufacturing product 27.1 per cent. Nearly 3,000 industries using $90,000,000 capital, employing 50,000 men, paying out $23,000,000 in wages, using $67,000,000 worth of material, and turning out products valued at $143,000,000, constituted the most important factor in Detroit's business prosperity the past year."

The automobile manufacturers regard these facts set forth by Mr. Howarth as sufficient reason why they are locating in Detroit, and it constitutes also the reason for Detroit's greatness as the center of automobile industry for the United States.

NEW YORK BRANCH FOR STEARNS.

Special Correspondence.

CLEVELAND, Jan. 16.—The F. B. Stearns Company is erecting a two-story addition 50 by 130 feet, adjoining its present factory and also a stock room 40 by 50 feet and an office about the same size. It is installing a number of machine tools and other equipment that will nearly double its facilities for turning out cars. An eastern branch is to be opened in a few days in New York, where a show room will be located in the Journal Building, corner 8th avenue and 58th street. A garage and repair shop will be opened in a nearby location not yet decided upon. The branch will be in charge of George F. Woolston, formerly of Woolston & Brew. James F. Patton, of this city, will act as salesman and demonstrator in New York.

The Stearns Company has recently closed orders for cars from H. M. Flagler, H. C. Harkness and W. L. Harkness, of New York, and Hugh B. Wick, Myron C. Wick and George C. Wick, of Youngstown. The car for Hugh C. Wick will be a special 60-horsepower, four-cylinder machine, designed for very high speed. H. M. Flagler's car will be a special limousine.

ACME AGENCY INCORPORATED.

Special Correspondence.

The Acme Motor Car Company of New York has been incorporated at Albany to sell automobiles, sundries and equipment. The officers are: President, R. Lewis Julian; vice-president and general manager, George H. Strout; secretary and treasurer, J. DeSmet Maguire. Mr. Strout was for six years identified with the bicycle business and was for three years the sales manager in New York of the eastern branch of the Monarch Cycle Manufacturing Company of Chicago.

The new company will occupy on February 1 the salesroom at 941-943 Eighth avenue, formerly occupied by the Pope Manufacturing Company. The company has been made distributing agents for the eastern half of New York, the northern half of New Jersey, and Fairfield county, Conn., for the Acme automobiles manufactured by the Acme Motor Car Company, of Reading, Pa.

Mrs. Edward Kennard, an English lady who is an enthusiastic devotee of the motorcycle, is having a special lightweight machine built by an English manufacturer.

Mr. Brumby, of Marietta, was here Friday night in his automobile. His machine being the first one ever seen in Ellijay was quite a curiosity. Some of our boys said the "tongue was broken out of it." It looked rather droll in a slow town like Ellijay.—*Times,* Ellijay, Ga.

SECRECY SHROUDS BIG ST. LOUIS PLANT.

Unrevealed Eastern Capitalists Interested in $1,000,000 Automobile Plant Under Construction—Twelve Acre Tract Bought—Product to Be Gasoline Cars and Improved Machinery.

Special Correspondence.

ST. LOUIS, Jan. 16.—A $1,000,000 automobile plant is being erected in St. Louis county, near Kirkwood, Mo., and although ground has been broken and construction work has been in progress for two months, the matter has been kept secret, having become known only recently. In order that the news of the establishment of the plant should not become public property, the deeds for the purchase of the ground were made out in the names of stenographers employed in the offices of the promoters. Many lots comprising a tract of twelve acres were purchased, but the deeds are held in the office of the company and have not been recorded.

The enterprise is promoted by A. L. Steinmeyer, of the Peyton Investment Company. It is being financed by eastern capitalists mostly, there being only one St. Louis shareholder.

The main factory building, which is in course of construction, occupies a ground area 300 by 300 feet and will be three stories high. Ground has also been broken for an office building, 50 by 90 feet. Contracts have been let for the construction of 140 cottages, to be rented to the employees. Besides the automobile factory, other buildings are to be erected, making a model automobile city.

"I have been working on the enterprise for three months," said Mr. Steinmeyer, "but did not want the matter to become public just yet. We have already spent considerable money in breaking ground and laying foundations. Nearly 100 men have been employed daily for two months.

"The enterprise is financed by twenty New York and Boston capitalists and one St. Louis man. We expect to have one of the largest factories in the country, which will give employment to hundreds. At first, only the auto factory will be built, but we are planning for the erection of many plants for the building of different kinds of machinery. Altogether, the investment in grounds and the contemplated improvements will represent an outlay of more than a million dollars.

"The automobiles to be manufactured will be improved gasoline machines. None of the present manufacturers are interested in the enterprise. An effort will be made to have the workmen live on the grounds. Operations will be started as soon as the buildings are completed."

Mr. Steinmeyer refused to give the names of the New York and Boston capitalists, nor would he state what St. Louisian was in the movement. He left the first of the week for New York to attend a meeting of the company.

When tightening down a cylinder head or flange after putting in a new gasket, take great pains to screw down the nuts evenly all around. If one side is screwed down too hard, there will be a weak spot on the opposite side, or the head or flange may even be sprung. Give each nut a fraction of a turn and keep going around until all are firmly down. Do not, however, make the mistake of putting on too much force and breaking the threads—not at all difficult to do with a small bolt and a long wrench.

One of the effects of the zero temperatures of the last week in Chicago has been to bring into public notice the large number of automobiles equipped with various devices to protect the passengers from the cold and wind. The small amount of snow has made it possible for almost every machine to continue in active operation so far during the winter. The icy winds, however, have brought out all sorts of protections. Machines almost enclosed in glass, with heaters inside, others with large coverings of canvas with small windows in the sides and front, plow up and down Michigan avenue, filled with passengers much more comfortable than those who ride in carriages and the old "sea-going kebs." Some drivers are demanding a double frame of glass for the front windows so that the moisture will not collect and freeze on the front panels.

Ames Howlett, a member of the A. C. of Syracuse, and P. J. Mentges started from Syracuse last Saturday noon in a Franklin car for New York to attend the automobile show. At Fort Bull, a little hamlet just east of Rome, they were proceeding along the towpath of the Erie canal when the rear wheels, although chain bound, slewed around on the ice and the car fell backward over an embankment to the ice on the canal. Mr. Howlett was thrown free of the car, but Mr. Mentges was pinned under it and badly shaken up. Sunday the car was rescued and, undaunted by the accident, Mr. Howlett, accompanied by George W. Holcombe and George H. Butler, continued the trip. Mr. Mentges nursed his bruises at Rome over Sunday and returned home.

The Maumee River Yacht Club has interested itself in auto boating, and several of its members contemplate the purchase of boats for racing on the Maumee river and bay. The club was addressed during the past week by V. E. Lacey, on the construction and operation of the two-cycle engine, and at the next meeting of the club a similar lecture on the four-cycle engine will be delivered by F. M. Underwood.

The Franco-American Automobile Co., of Montreal, Canada, has opened a garage at 308 St. James street, near Victoria square, in the premises recently occupied by the General Automobile Company. Repair work will be done under the supervision of a French expert, Georges Husson, and supplies of all kinds will be kept in stock. The company will act as agent for the purchase and sale of automobiles of all makes.

About $5,000 of the necessary capital of $10,000 to secure the location at Bath, N. Y., of the Kirkham Motor Cycle Co.'s factory has been subscribed by Bath merchants. The committee in charge of the funds anticipates no trouble in securing the subscription of the other $5,000 within a short time. The company will employ about 40 men at the outset.

Anent the size of repair bills, it is interesting to record the experience of Mrs. Mary Dickerson, of Kansas City, who has a Clement-Bayard limousine. Since she purchased the car last spring, she has spent just 50 cents on it for repairs. She has a chauffeur, but he has not had to purchase any material nor have any work done outside of Mrs. Dickerson's own garage. The car is on the streets of Kansas City every day, hot or cold, and is being used on numerous tours throughout the surrounding country. Mrs. Dickerson considers this a record and is proud of it. She is the most enthusiastic motorist in her section of the country.

Henry M. Leland, vice-president and general manager of the Leland & Faulconer Mfg. Co., of Detroit, Mich., has been appointed general manager of the Cadillac Automobile Co., of the same place. Mr. Leland's experience of nearly forty years in connection with large manufacturing concerns has made him particularly well fitted for the new position.

Among the 1905 agents for the Buick cars, will be the Sidney B. Bowman Automobile Co., of New York City; the Tremont Garage, 541 Tremont street, Boston, and the Pennsylvania Electric Co., Philadelphia. H. J. Koehler, of 845 Broad street, Newark, N. J., is eastern sales manager for the Buick company.

The first 1905 automobile license to be granted in Philadelphia, No. 101, was secured by Colonel James Elverson, Jr., owner of the *Inquirer*, on Jan. 3. The new tag has a red ground with white figures. More than 200 licenses were granted by the Bureau of Boiler Inspection the first day.

F. A. Adams, formerly manager of the Commercial Department of the Knox Automobile Co.'s Boston branch, has resigned and is now acting in a similar capacity for the new Knox Motor Truck Co., Springfield, Mass. Offices and salesroom have been opened in the Tremont Garage, Boston.

The Grand Jury of Montgomery County, Pennsylvania, recently refused to bring in a true bill against a number of "offenders" against township laws who had failed to sound their horns at crossings, and who, on being arrested and fined, appealed their cases.

The Columbia Lubricator Co., of 78 Broad street, New York, will be represented in the middle West by the Excelsior Supply Co., 233 Randolph street, Chicago, which will act as distributing agent for Monogram oils and greases for the states of Illinois, Wisconsin, Iowa, Nebraska and Kansas.

A new firm, the Randliff Motor Car Co., has secured the premises formerly occupied by the Autocar Co., at 24-26 Columbus avenue, Boston. The place is being remodeled as a salesplace for Panhard and Maxwell cars. R. F. Coburn will have the management.

Harrington's Auto Station No. 1, Worcester, Mass., will handle the Thomas Flyer for 1905. This completes the placing of Thomas agencies for New England with the exception of Rhode Island territory, which will be assigned during the New York Show.

An order for a car load of Michigan Model D cars, has been received from Sweden, by the Michigan Automobile Co., of Kalamazoo, which recently made a shipment of the same style of machines to New Zealand.

A new building 45x80 feet, of cement blocks, one story in height is being erected in Rochester, N. Y., on South Union street, near East avenue, for use as a garage by Arthur McNall, who expects to occupy the building in about six weeks. He will handle the Franklin this year.

The Monnier Cycle Supply Co., of Detroit, Mich., will, after February 1, 1905, change its name to the Monnier Auto & Cycle Supply Co. The company has leased the entire building at 68 Congress street, Detroit, and also the upper part of the adjoining building.

E. S. Breed, of 40 Columbus avenue, Boston, has been appointed New England agent for the Haynes-Apperson automobiles. F. C. Graves is head salesman.

John G. Parons, a well-known electrician, is bringing out a new electric car, and will show a model for the first time at the forthcoming shows.

The Napier Motor Car Co. of America will continue its exhibit in the reception room of the Waldorf-Astoria, Wednesday, Thursday and Saturday, of next week.

Monte L. Green, formerly of *The Spokesman*, has become identified with the sales department of the Victor Rubber Co., Springfield, Mass.

F. H. Fowler, formerly of the Knox Auto Co., and later with the Matheson Motor Car Co., has opened a garage in Springfield, Mass.

The Moore-Smith Co., of Boston, agent for the Autocar, has removed from 24 Columbus avenue to 38 Columbus avenue, Boston.

The New York agency for the Matheson touring car has been secured by Shepard Bros., 500 Fifth avenue, New York.

The Ohio Motor Car Company, leading dealers of Cleveland, will make a feature of the Buick line this season.

E. S. Breed, of 41 Columbus avenue, Boston, Mass., has been appointed New England agent for Haynes cars, for 1905.

Several errors crept into the advertising pages of last week's issue of THE AUTOMOBILE, as a result of hurried work incidental to getting out the largest issue of a weekly automobile paper ever published in America; and the first opportunity to make corrections is taken advantage of.

On advertising page 46, in the advertisement of the Association of Licensed Automobile Manufacturers, the words "list of unlicensed importers" should read "list of *licensed* importers."

On advertising page 81 the type at the ends of three lines in the upper panel of the Standard Welding Co.'s advertisement became deranged, three words being incomplete. They should be respectively "wishes," "energetic" and "done."

On advertising page 85 the price of the Motor Car Equipment Co.'s A. B. C. lamp was made to appear at $300. This, of course, should read $30.

Arrangements have been made for the establishment of a Philadelphia branch of the Reo Motor Car Co., with F. W. Stockbridge as manager. The location will be in the Mink Arcade on Penn Square.

A new garage is about to be opened in Nashville, Tenn., by J. S. Roller, the establishment to be under the management of J. L. Hedges. Extensive alterations are being made in the building to be used, which is at 179 N, College street, Nashville.